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November 9, 2022

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Application of Virginia Electric and Power Company,
For revision of rate adjustment clause: Rider S, Virginia City Hybrid Energy Center
for the Rate Years Commencing April 1, 2022 and April 1, 2023
Case No. PUR-2021-00114

Dear Mr. Logan:

Pursuant to Ordering Paragraph (3) of the Final Order issued in this docket on February 8, 2022, please find enclosed for electronic filing in the above-referenced matter *Virginia Electric and Power Company's Report on Virginia City Hybrid Energy Center Pathways for Economic Viability.*

Please do not hesitate to contact me if you have any questions in regard to this filing.

Highest regards,

/s/ Joseph K. Reid, III

Joseph K. Reid, III

enc.

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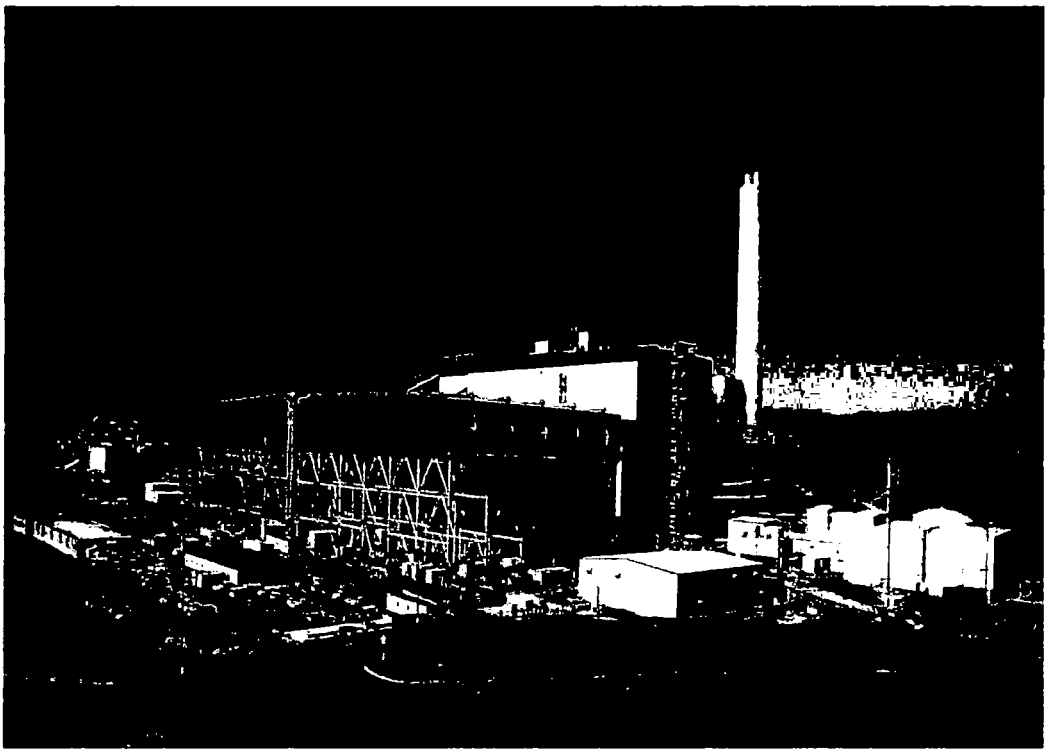
REPORT ON VIRGINIA CITY HYBRID ENERGY CENTER PATHWAYS FOR ECONOMIC VIABILITY

Case No. PUR-2021-00114

November 9, 2022



REPORT ON VIRGINIA CITY HYBRID ENERGY CENTER PATHWAYS FOR ECONOMIC VIABILITY

Case No. PUR-2021-00114

I. EXECUTIVE SUMMARY

The Virginia City Hybrid Energy Center ("VCHEC") is one of the cleanest, most technologically advanced utility-scale power stations in the United States utilizing coal-based fuels. The station began providing reliable generation for Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company") and its customers in 2012. In the 10 years since, VCHEC has generated more than 22 million megawatt hours ("MWh") of electricity while also providing considerable economic and environmental benefits (both air and water quality) to southwestern Virginia, as well as reliability benefits to the overall electric grid. The Company steadfastly supports continued operation of the facility for these reasons. Indeed, modeling demonstrates that when natural gas prices are "high," continued operation of VCHEC is economic and in customers' best interest.[1]

In Case No. PUR-2021-00114, the Virginia State Corporation Commission ("Commission") adopted a Proposed Stipulation and Recommendation ("Stipulation") signed by the Company, Commission Staff, and the Sierra Club, whereby the Company agreed to produce a report detailing "an analysis of a possible pathway towards economic viability for VCHEC on a going-forward basis." The Stipulation detailed several areas of analysis to be included in the report, including certain retirement scenarios and discussion of potential alternative uses for the site. The Company accordingly presents the following Report, which addresses those issues.

The Report was conducted pursuant to the terms of the Stipulation, not because the Company endorses discontinuing operations at VCHEC. On the contrary, the Company respectfully submits that the evidence in this Report does not support early retirement of the facility. Key benefit areas discussed herein include (i) Regional, (ii) Environmental, (iii) Grid Reliability, and (iv) Current / High Gas Price Market Economics. This comprehensive approach captures the important economic and environmental functions VCHEC serves within the Company's generation system which are not considered by traditional economic analysis.

From a regional perspective, VCHEC has supported the southwest Virginia economy since it began construction in the late 2000s. Over 2,000 people were employed to help with the facility's construction, and in operation it continues to employ or support over 300 jobs. VCHEC's ongoing operations are estimated to provide approximately $25 million in labor income and $156 million in economic output annually (in 2022 dollars) in the southwestern Virginia region. Alongside its support for Virginia workers, the facility makes investments in the region through significant contributions to tax base and charitable giving.

[1] It should be noted that the cost assumptions for the Company's "high fuel" prices used for modeling are less than current market prices, which means that actual current prices result in VCHEC providing an even greater benefit to customers.

VCHEC also delivers unique environmental benefits. It is the only generation facility in Virginia that can burn the garbage of bituminous ("GOB") coal—a waste coal that presents significant environmental and public safety hazards to Virginia.[2] The General Assembly this year ordered a study of GOB's impact in the state, which is expected to show that GOB presents ongoing environmental challenges. VCHEC has a history of contributing to GOB cleanup efforts, and it represents the only current viable option for permanent restoration of affected areas. The Company estimates that it would have cost over $250 million to otherwise reclaim, transport, and store the four million tons of GOB VCHEC has already converted to energy.

Any credible analysis should also consider the reliability implications of potential plant closure. In VCHEC's case, under PJM's normal process, early retirement would prompt a reliability study that may require system upgrades by Appalachian Power Company, which serves the geographic area surrounding VCHEC. VCHEC also provides reliability benefits, including fuel source diversity and local fuel inventory, which offers stability against weather and market uncertainty. Recent market shifts, particularly with respect to natural gas, have underscored the impact of these benefits. The Company anticipates VCHEC will generate significant long-term customer value in a high fuel cost environment.

As directed by the Commission, this Report also presents economic modeling of retirement scenarios in 2026 and 2030 using the Company's 2022 Integrated Resource Plan ("IRP") Plan B. Near-term economic modeling shows a negative customer net present value ("NPV"), though the Commission should exercise caution in tying retirement decisions exclusively to short-term modeling or economic analyses that exclude factors such as economic development, environmental benefits, and resource diversification benefits.

To provide a more comprehensive view of VCHEC's economic viability moving forward, the Company has also modeled a 2045 retirement scenario, which assumes continuation of the current fuel cost environment (though at a price level below actual current pricing). This retirement scenario shows positive NPV for customers, demonstrating that it likely would be economic to continue to operate VCHEC through at least 2045. The Company's modeling demonstrates that if natural gas prices remain relatively high—even if they fall below actual current prices—continuing to operate VCHEC is economic and in customers' best interests.

As directed, the Report presents the lifetime revenue requirement for each retirement scenario. Although the lifetime revenue requirements for the 2026 and 2030 retirement scenarios are comparatively lower than the 2045 retirement scenario, these figures do not include the replacement energy and capacity costs and any other associated impacts of facility closure. Additionally, lower lifetime revenue requirements do not result in lower costs for customers in the short term. Early retirement would spread the facility's construction costs over a shorter period, raising customer bills in the near term. By contrast, retirement of VCHEC in 2045 shows a steady decline in typical residential customer's bill over the near and long-term.

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[2] Appalachian School of Law, ESI Econsult Solutions, Inc., *Addressing Virginia's Legacy GOB Piles* at 3 (Mar. 2022), available at https://asl.edu/storage/files/28/Final%20GOB%20Pile%20report%20March%202022.pdf ("*ASL Report*").

As directed, the Report also analyzes a variety of alternative uses for the VCHEC site in the event the unit is retired early, though many would likely face substantial challenges. The site's location outside the Company's service territory renders solar development difficult because of the distance a distribution-level interconnection would have to span. The VCHEC site is similarly not suitable for onshore wind as it is not located on a ridgeline, where such facilities are most economically operated. The VCHEC site could support an approximately 600 MW energy storage facility, but is not as ideal as other locations, where such a facility could more readily address grid congestion and other issues.

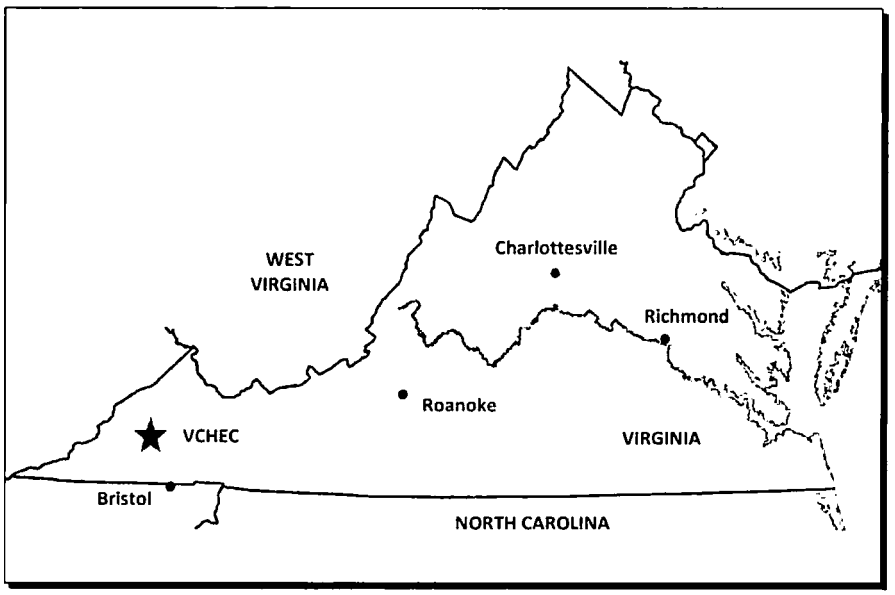
The Commonwealth's 2022 Energy Plan highlights the promise of small modular reactors ("SMRs"), once sufficiently developed. When it is determined that it is appropriate to retire VCHEC, SMR may offer a viable option for continued generation at the VCHEC site.

Although coal combustion residuals ("CCR") storage facilities are present at VCHEC, Wise County has stated that it will not permit importation of CCR into the County, effectively rendering moot any large-scale storage potential, and the Commission recently declined to order further study of this option. The Company views this option as neither practicable nor advisable.

The Company believes the evidence from each benefit area considered in this Report supports continued operations at VCHEC. The facility's operations are currently economic, given present market conditions and high natural gas prices, and it has a path for economic operation through at least 2045. The significant regional economic and environmental benefits which would be foregone in any early-retirement scenario also militate against early retirement. In the Company's view, the lack of realistic near-term or medium-term alternatives further strengthens the case against early retirement of VCHEC.

II. BACKGROUND

VCHEC is a 610 megawatt ("MW") (nominal) electric generating facility located in Wise County, Virginia that utilizes a combination of waste coal, waste wood, and run-of-mine coal as fuel. VCHEC is an important part of Dominion Energy Virginia's diverse generation portfolio. The facility provides reliable power—enough to power 150,000 homes—and reduces the Company's reliance on mined coal, oil, natural gas, and market purchases of power. Since beginning commercial operations on July 12, 2012, VCHEC has generated more than 22.2 million MWh—enough to power the entire United States for two days. In addition, VCHEC provides significant economic and environmental benefits to southwestern Virginia and the surrounding region.



In 2004, the General Assembly declared a facility like VCHEC to be in the public interest:

> To ensure a reliable and adequate supply of electricity, and to promote economic development, an investor-owned distributor that has been designated a default service provider under this section may petition the Commission for approval to construct, or cause to be constructed, *a coal-fired generation facility that utilizes Virginia coal and is located in the coalfield region of the Commonwealth*, as described in § 15.2-6002, to meet its native load and default service obligations, regardless of whether such facility is located within or without the distributor's service territory. . . . *The construction of such facility that utilizes energy resources located within the Commonwealth is in the public interest*, and in determining whether

to approve such facility, the Commission shall liberally construe the provisions of this title.[3]

The law further created incentives for the construction of such a facility not only to increase the reliability of the Commonwealth's electrical system, but also to improve the economy of southwestern Virginia.

In 2007, the General Assembly repealed Va. Code § 56-585 G, but at the same time amended Va. Code § 56-585.1 A 6 ("Section A 6"), which again declared a facility like VCHEC to be in the public interest and provided that the Company could recover the costs of such a facility through a rate adjustment clause ("RAC"):

> To ensure a reliable and adequate supply of electricity, to meet the utility's native load obligations and to promote economic development, a utility may at any time, after the expiration or termination of capped rates, petition the Commission for approval of a rate adjustment clause for recovery on a timely and current basis from customers of the costs of (i) *a coal-fueled generation facility that utilizes Virginia coal and is located in the coalfield region of the Commonwealth*, as described in § 15.2-6002, regardless of whether such facility is located within or without the utility's service territory. . . . *The construction of any facility described in clause (i) is in the public interest*, and in determining whether to approve such facility the Commission shall liberally construe the provisions of this title. (emphasis added)

The Commission issued a certificate of public convenience and necessity ("CPCN") for the VCHEC facility in Case No. PUE-2007-00066 and approved a RAC, Rider S, for the Company to recover costs associated with its construction and operation in 2008.[4] In its Final Order, the Commission recognized that VCHEC was "statutorily favored" and it "represent[ed] a reasonable coal-fired addition to [the Company's] generation fleet."[5] The Commission found that the Company did "not need to establish that [VCHEC] is the least cost option" because the General Assembly had determined the facility to be in the public interest so long as costs were reasonable and prudent.[6] The Commission declined to reject a project located outside of the Company's service territory because the General Assembly had specifically "determined that it is in the public interest for a utility to construct a coal-fired facility outside of its service territory to benefit economic development in the coalfield region."[7] Further the Commission found that

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[3] Va. Code § 56-585. G (2004) (emphasis added).

[4] *Application of Virginia Electric and Power Company, For a certificate of public convenience and necessity to construct and operate an electric generation facility in Wise County, Virginia, and for approval of a rate adjustment clause under §§ 56-585.1, 56-580 D, and 56-46.1 of the Code of Virginia*, Case No. PUE-2007-00066, Final Order (Mar. 31, 2008) ("*2006 CPCN Final Order*").

[5] *2006 CPCN Final Order* at 11.

[6] *Id.* at 12.

[7] *Id.* at 14.

VCHEC would "provide economic benefits and [would] have no material adverse effect upon the reliability of electric service."[8]

VCHEC was a significant construction project in southwestern Virginia, and has provided regional economic benefits in the form of jobs and financial investment during both the construction and operation phases.

As noted below, in addition to meeting the Company's load requirements and ensuring system reliability, VCHEC also contributes to important environmental objectives related to the reclamation and use of GOB waste coal in southwestern Virginia. VCHEC's stringent air permit renders it one of the cleanest generation facilities in the United States that utilizes coal-based fuels from an emissions perspective. Its mission to utilize GOB coal as fuel is critical to the remediation of this waste product, which presents significant environmental and public safety hazards to southwestern Virginia. This makes VCHEC an important environmental asset to the region.

In the Company's 2021 annual Rider S proceeding, Case No. PUR-2021-00114, the Company, Commission Staff, and the Sierra Club entered into a Stipulation that proposed to resolve all issues raised by these parties. The Commission adopted the Stipulation in its Final Order, dated February 8, 2022. In Paragraph 2 of the Stipulation, the Company agreed to complete an analysis of a possible pathway towards economic viability for VCHEC on a going-forward basis. The Company agreed to file a report detailing this analysis within nine months of the Commission's Final Order, before the next Rider S update is filed, and include, at a minimum, the following:

a. Analysis of scenarios in which VCHEC retires prior to 2045, the latest date required by Code § 56-85.5 B 3. Specifically, the Company should include analyses of potential unit retirement in years 2026 and 2030;
b. For any retirement scenario presented in the report, the Company shall provide an accompanying lifetime revenue requirement, with supporting calculations, in excel format, with formulas intact;
c. For any retirement scenario presented in the report, the analysis should include, without limitation, a discussion of (i) local economic impacts; (ii) system reliability; (iii) environmental justice; and (iv) the social cost of carbon;
d. Analysis of options for repurposing the VCHEC site if the unit is retired, including use for hosting solar, wind, and/or energy storage resources. Such analysis should include, without limitation, a discussion of (i) local economic impacts; (ii) system reliability; (iii) environmental justice; and (iv) the social cost of carbon; and
e. Discussion of pathways towards greater utilization of the unused coal combustion residuals ("CCR") storage capacity at VCHEC.[9]

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[8] *2006 CPCN Final Order* at 22.

[9] *Application of Virginia Electric and Power Company, For revision of a rate adjustment clause; Rider S, Virginia City Hybrid Energy Center, for the rate years commencing April 1, 2022, and April 1, 2023*, Case No. PUR-2021-00114, Ex. 14, Stipulation at Par. 2 ("*2021 Rider S Biennial Update*").

Pursuant to Paragraph 2 of the Stipulation, the Company files this report to provide its analysis of the VCHEC facility, its economic and environmental benefits, and potential paths forward ("Report").

III. ECONOMICS OF VCHEC

The economic analysis supporting VCHEC, which is driven by several unique factors, shows that there is a path for economic operation through at least the Virginia Clean Economy Act's ("VCEA") stated retirement date in 2045.[10] Any comprehensive retirement analysis must consider more than the cost to operate the facility and generate electricity. For example, VCHEC is still relatively new in the Company's generation portfolio; it has only been in operation for about 10 years and can operate more than 50 years before reaching its end-of-life. Additionally, because of VCHEC's unique operational parameters, including its clean-coal technology and ability to convert waste coal and waste biomass to energy, it cannot be compared to legacy coal-fired generation facilities.

Economic Benefits

VCHEC provides significant economic benefits to the southwestern Virginia region, which has long been known as the Commonwealth's "coalfield region." For decades it has been dependent on coal, and the area has experienced economic hardship as the country transitions away from using coal as a fuel source for electricity generation. VCHEC has become a driver for the southwestern Virginia regional economy, providing benefits to several Virginia counties, including Wise, Russell, Dickenson, Buchanan, Tazewell, Scott, Washington, and Lee, as well as bordering counties in Kentucky, West Virginia, Tennessee, and North Carolina. The Company engaged Mangum Economics to conduct an analysis of the economic benefits VCHEC provides to the southwestern Virginia region ("Mangum Report"). The Mangum Report estimated that VCHEC will provide $156 million annually in benefits.[11]

The facility employed over 2,000 people during construction. At the time, the VCHEC project was the largest construction project in Virginia and the Curley Hollow Landfill was the largest civil project in the Commonwealth's history. During operation, VCHEC supports approximately 121 direct jobs, and an additional 180 indirect jobs that support operation of the facility.[12] The VCHEC facility is the largest single taxpayer and the largest industrial employer in Wise County; VCHEC currently provides over $11 million annually in tax revenue to Wise County.[13]

During its first five years of operation, VCHEC contributed nearly half a billion dollars to the regional economy, including $48 million in property taxes, $6.5 million in payroll, and $500,000 in charitable giving. Since achieving commercial operations, VCHEC has donated more than $3.5 million in charitable contributions to support southwestern Virginia social, educational, and arts programs. As the Mangum Report demonstrates, VCHEC's operations provide

[10] VCHEC's operational life is through 2067.
[11] The Mangum Report is provided as Attachment 1.
[12] *See* Mangum Report at 10.
[13] *Id.* at 1.

approximately $25 million in labor income and $156 million in economic output annually (in 2022 dollars).[14]

VCHEC continues to provide significant regional economic benefits in an area of the Commonwealth that has come to depend on its presence. Retiring the facility would abruptly end the significant economic benefits its continued operation provides to southwestern Virginia, creating additional environmental justice concerns. Further, these purely economic benefits do not include the environmental benefits VCHEC provides as a mechanism for the remediation of GOB, which is discussed more fully below.

Environmental Benefits

VCHEC is one of the cleanest, most technologically advanced utility-scale power stations in the United States that utilizes coal-based fuels. The use of air-cooled condensers allows VCHEC to operate on less than 5% of the water used by a typical power station of its size. Wastewater is treated on site and recycled for use in "gray water" applications. In fact, when VCHEC is online, the gray water demand is sufficient to allow VCHEC to be a "zero discharge" facility with regard to industrial wastewater. With no wastewater discharge, there is zero potential to adversely impact the Clinch River watershed, to which the station's industrial wastewater would otherwise discharge.

Additionally, the facility uses circulating fluidized bed ("CFB") technology. The two CFB boilers supply steam to a single steam turbine generator and are designed to capture sulfur dioxide ("SO_2") through the injection of calcium carbonate into the boiler furnaces. The boilers are also equipped with selective non-catalytic reduction, which captures nitrogen oxide ("NO_x") emissions through injection of ammonium hydroxide into the flue gas stream, post-combustion dry flue gas desulfurization polishing scrubbers utilizing calcium hydroxide for additional SO_2 control and activated carbon injection and fabric filters for mercury ("Hg") and particulate matter ("PM") control. VCHEC's state-of-the-art air quality control system allows the facility to operate at very low air emissions levels. SO_2, NO_x, PM, and Hg emissions have been reduced between 93 and 99.8% compared to 1960s technology, as can be seen in Table 1 below.

[14] Mangum Report at 1.

Table 1

Combustion Technology	SO_2 (TPY)	NO_X (TPY)	PM (TPY)	Hg (PPY)
1960's PC Unit	56,174	29,023	133,880	562
1970's PC Unit	56,174	18,256	1,339	107
1980's CFB Unit	13,452	10,762	451	75
1990's CFB Unit	6,726	5,381	361	50
VCHEC	604	1,920	329	5
% Reduction over 1960's Technology	**98.9%**	**93.4%**	**99.8%**	**99.1%**

At the time the air permit was issued, it was the strictest permit of its kind in the United States. Additionally, the facility has an onsite solid waste management facility—the Curley Hollow Landfill. Finally, the facility is "carbon capture ready," so in the event this technology becomes economical on a utility-scale, it could be installed without significant modifications to the existing infrastructure.

VCHEC provides significant environmental benefits to the region and the Commonwealth through its unique ability to process GOB, a toxic byproduct of historical coal production. GOB is coal that did not meet fuel specifications prior to promulgation of the Surface Mining Control and Reclamation Act ("SMCRA") of 1977 and was thus discarded into valleys and waterways. GOB has piled up in southwestern Virginia for over a century and has remained largely untouched as there was no beneficial application for this material prior to VCHEC's operations.

Current estimates indicate that there are more than 100 million tons of GOB remaining in southwestern Virginia, including more than 200 GOB piles.[15] The Virginia Department of Energy ("DOE"),[16] as directed by House Bill 657, is currently studying the impact of GOB in Virginia. Its findings are expected to show that GOB continues to pose significant environmental challenges throughout the region.

[15] *ASL Report* at 3, 10-11. Of the known GOB piles, at least 198 require remediation; the other 47 known piles have been capped and graded, but that is only a temporary solution and additional work will be needed to clean up those piles in the future. *ASL Report* at 11 n.4.

[16] The Virginia Department of Energy was previously known as the Virginia Department of Mines, Minerals, and Energy ("DMME").

Indeed, GOB piles are extremely harmful to the environment.[17] The piles cause flooding, rendering property unusable and displacing families and businesses. GOB also releases metals, acid runoff, sediment, and other toxic materials into waterways and groundwater. A technical report issued by the US Office of Surface Mining Reclamation and Enforcement indicates that one acre of GOB-laden land introduces over 10 tons of toxic sediment into streams annually. Due to the environmental damage caused by GOB pile runoff, the Virginia Department of Environmental Quality listed a 3.54-mile portion of Dumps Creek, the region's largest stream located in Russell County, as "impaired" on the Commonwealth's 1994 Clean Water Act section 303(d) list of impaired waters.

In addition to contributing to water contamination and flooding, GOB piles experience natural oxidation, which leads to spontaneous combustion and the release of fine particulates and greenhouse gases such as methane and CO_2. Once ignited, the piles are difficult to extinguish and can burn for years.[18] Methane is up to 81 times more detrimental to the ozone layer than CO_2. Existing GOB piles gradually and continuously emit greenhouse gases and will continue to do so in perpetuity unless and until the GOB is removed from the environment.

In 1977, the Virginia General Assembly began addressing the threat of GOB by enacting the SMCRA, outlawing open dumping of GOB and implementing steps to remediate existing GOB piles. Virginia's regulatory program was approved in 1981 and Virginia began receiving abandoned mine land ("AML") grants. In 1982, the DMME selected the Straight Hollow GOB pile as one of the first reclamation projects. The project, which included grading, capping, and establishing vegetation on one of the five GOB piles in that location, was completed in 1984 at a cost of approximately $1.7 million. In 2008, DMME and GOBCo, LLC ("GOBCo") conducted an excavation of the Straight Hollow GOB pile to evaluate it for full removal. The excavation uncovered areas of combustion and further investigation determined the pile was actively burning. DMME and GOBCo undertook the task of removing the GOB, all of which was converted to energy at VCHEC, down to the original topography. The Straight Hollow GOB pile is evidence that grading, capping, and establishing vegetation is not sufficient to remediate the environmental harm caused by GOB.[19] Full removal is necessary, but once removed, the GOB must go somewhere.[20]

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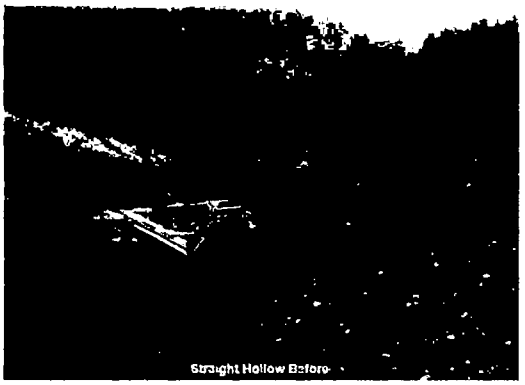
[17] The environmental threats of GOB also pose significant economic threats to the region because the harmful greenhouse gases affect the air quality of the entire region, and the piles are at high risk of catching fire. The air quality impacts health and property values, and the fires are challenging and costly to extinguish or control. *ASL Report* at 10, 20.

[18] *ASL Report* at 80.

[19] Former DMME abandoned mine land projects coordinator Richard Davis has reported that "[o]ur experience has proven that the best reclamation method is complete removal of the gob pile." Debra McCown, *Gobco mining coal waste piles, turning gob into cash*, Danville Register and Bee (Mar. 8, 2010).

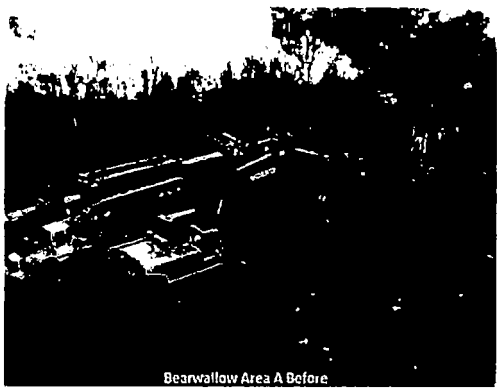
[20] *ASL Report* at 11 n.4, 31. Further, a 2018 study concluded that GOB piles in Virginia are more challenging to mitigate in place because of their slope and aspect effects. *See* Barry Stewart, C.E. Zipper, W. Lee Daniels, Virginia Cooperative Extension, *Reclamation of Coal Refuse Disposal Areas* at 4 (2018), available at https://vtechworks.lib.vt.edu/bitstream/handle/10919/84249/CSES-215.pdf?sequence=1&isAllowed=y.



VCHEC is a critical partner in the GOB reclamation effort, creating market incentives for remediation.[21] The fuel blend for the facility consists of both GOB and non-GOB[22] waste coal, waste wood, and mined coal. As of June 2022, VCHEC's year-to-date fuel mix hit a record-high waste fuel percentage consisting of approximately 98% waste fuel (comprised of 46% GOB, 39% non-GOB waste, 13% waste wood), and 2% run-of-mine coal. VCHEC is the *only* electric generating facility in Virginia equipped to process waste coal. The facility decarbonizes waste coal through complete stochiometric combustion and converts the material into energy. Between July 2012 and August 2021, VCHEC converted over four million tons of GOB to energy, helping to restore the Straight Hollow, Tom's Creek, Hurricane Creek, and Bearwallow sites. Photos of the Straight Hollow site are above. Photos of Tom's Creek, Hurricane Creek, and Bearwallow sites are included below.

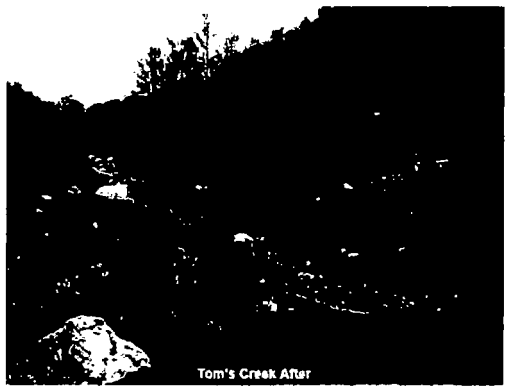
[21] *ASL Report* at 4-5.

[22] Non-GOB waste is waste recently generated that has no economic value beyond conversion to energy at VCHEC and includes, but is not limited to, waste from mining and preparation plant operations, pond fines, and highway construction.


Bearwallow Area A Before


Bearwallow Area A After

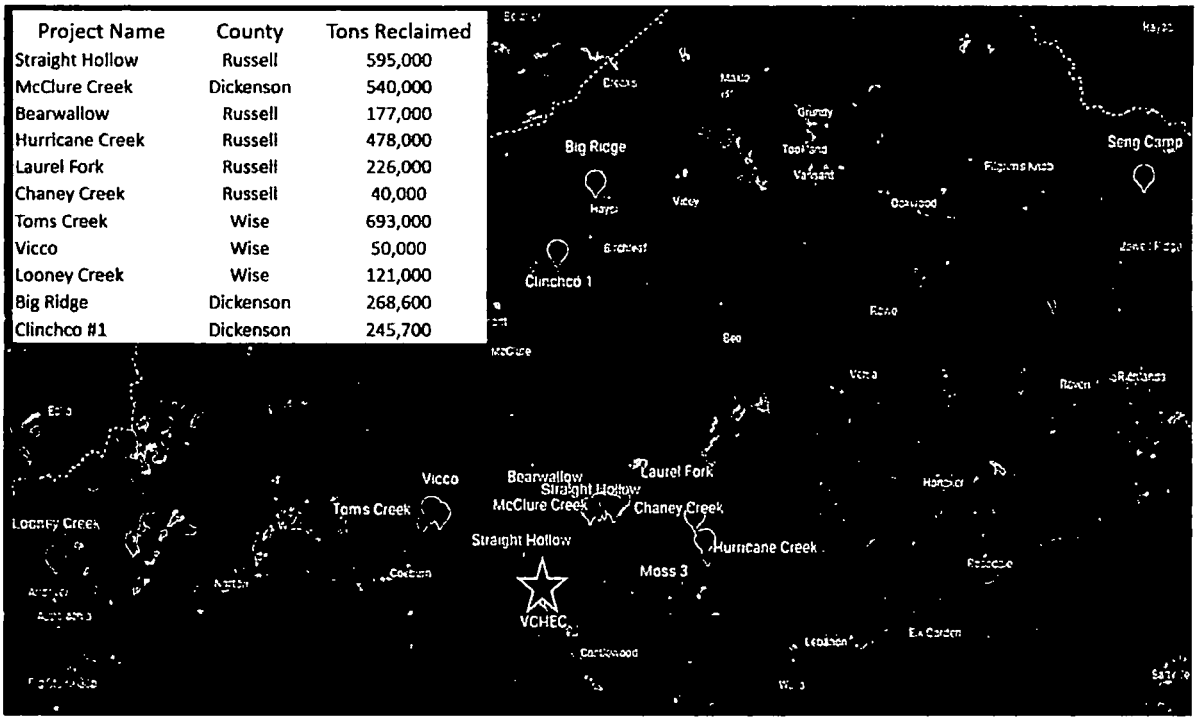

Tom's Creek Before


Tom's Creek After

To date, the Company has enabled the completion of 11 GOB reclamation projects, and more are in process and planned. Figure 1 below shows the location of the completed and in-process reclamation projects.

Figure 1

Project Name	County	Tons Reclaimed
Straight Hollow	Russell	595,000
McClure Creek	Dickenson	540,000
Bearwallow	Russell	177,000
Hurricane Creek	Russell	478,000
Laurel Fork	Russell	226,000
Chaney Creek	Russell	40,000
Toms Creek	Wise	693,000
Vicco	Wise	50,000
Looney Creek	Wise	121,000
Big Ridge	Dickenson	268,600
Clinchco #1	Dickenson	245,700



Because of the cleanup effort made possible by VCHEC's ability to convert GOB to energy, the 3.54-mile section of Dumps Creek previously designated as impaired was removed from Virginia's list of impaired waters in 2016.[23] A photo is included below.

After the Hurricane GOB pile in the Dumps Creek watershed (inset photo) was removed, the area was revegetated.

[23] United States Environmental Protection Agency, *Nonpoint Source Success Story: Implementing Best Management Practices on Mined Land Improves Aquatic Health of Dumps Creek* (April 2019), available at https://www.deq.virginia.gov/home/showpublisheddocument/5143/637490875673370000.

Despite the success of the cleanup of Dumps Creek, GOB still poses a significant threat to Virginia watersheds. Two of Virginia's most prominent watersheds, the Powell River and the Clinch River, are within a 10-mile radius of more than 30 GOB piles, posing a significant environmental threat that will continue unless and until permanently removed.[24] VCHEC's ability to use GOB as a fuel source lowers the comparative cost of full removal and remediation as it creates a market for an otherwise unmarketable, harmful, and costly waste product. Full removal and remediation of GOB piles increases the productive use of land, promoting economic development, and can increase property values. VCHEC's use of waste coal as a fuel source has helped reclaim approximately 1,700 acres of land for productive use since 2012, providing an estimated annual benefit of $755,000.[25] VCHEC's use of GOB as a source of fuel will contribute to the economic revitalization of the southwestern Virginia region while providing significant environmental benefits.

The environmental benefits VCHEC provides by converting GOB to energy are substantial. The reclamation-to-energy process to remediate coal waste is a cost-effective and permanent solution to the significant environmental problem waste coal poses.[26] A recent Pennsylvania and West Virginia study demonstrated that remediation and beneficiation of GOB by energy conversion decreases CO_2e (carbon dioxide equivalent) emissions up to 93% over the emissions generated by that material burning in the environment.[27] VCHEC's CO_2 emissions profile has a significantly lower greenhouse impact than GOB left to oxidize in the environment. Without VCHEC, GOB would be abandoned in the environment, continuing to leach contaminants into the water and emit harmful greenhouse gases into the atmosphere because VCHEC provides the only technologically and economically feasible and permanent option for remediating GOB. Having decades more experience with addressing legacy GOB issues, both Pennsylvania and West Virginia acknowledge waste-to-energy conversion as the only feasible option for remediating this environmental hazard, and therefore actively encourage and assist industry in the remediation process via legislative, regulatory, and financial means.

The only other proposed method of managing GOB is to reclaim, transport, and store the waste coal in a captive industrial landfill. This proposal is neither realistic nor effective because not only is this option very costly, but also it actively encourages spontaneous combustion and the resulting environmental damage by aggregating the GOB in one location. Additionally, this proposal creates a facility that must be maintained in perpetuity with maintenance, runoff, and methane generation considerations.[28] The Company estimates that it would have cost over $250 million to otherwise reclaim, transport, and store the four million tons of GOB VCHEC has already converted to energy without consideration for future maintenance of such a facility. The Company is currently exploring options to increase VCHEC's run times and, as is evidenced by the recent record 98% waste fuel achieved by the facility, utilize less run-of-mine coal and more

[24] *ASL Report* at 15.
[25] *Id.* at 28.
[26] It is estimated that the cost of remediation of the GOB in Pennsylvania and West Virginia, which contains approximately 221 million tons of coal refuse, is more than $5 billion. Fraser, Robert G., Fennell, Patrick, TRC Environmental Inc., *Net Air Emission Benefits from the Remediation of Abandoned Coal Refuse Piles* ("*Net Air Emission Benefits*"). One study estimates that the average cleanup costs for extinguishing GOB pile fires is $120,000 per acre. *ASL Report* at 25.
[27] *See Net Air Emission* Benefits at 17; *see also ASL Report* at 27.
[28] *ASL Report* at 38-39 (discussing the significant costs of proper long-term storage and maintenance for GOB).

GOB to expedite remediation and removal of this hazard that impacts not only the coalfield region of Virginia, but all ecosystems downstream and downwind.

Recent Legislation

In 2022 the Virginia General Assembly passed legislation—House Bill 657 ("HB 657")[29] and House Bill 1326 ("HB 1326")[30]—recognizing the continuing environmental threat GOB poses to southwestern Virginia and directing studies to determine the best method to clean up the GOB piles. These recent legislative pronouncements from the General Assembly underscore the Commonwealth's policy in favor of cleaning up GOB. HB 1326 acknowledges the "environmental hazards of abandoned coal mines" and finds the removal of waste coal "in the public interest." HB 1326 further directs the Commission on Electric Utility Regulation to review information on the amount of waste coal and "options for cleaning up such waste coal piles." VCHEC remains the only permanent available reclamation option.

HB 657 directs the DOE to "identify the approximate volume and number of waste coal piles present in the coalfield region of the Commonwealth and options for cleaning up such waste coal piles, including the use of waste coal in generation of electricity." HB 657 also directs the DOE to "collaborate with other states in which waste coal piles are located that are members of the Appalachian Regional Commission to identify best practices for cleaning up waste coal piles." The DOE must submit its report to the General Assembly by December 1, 2022.

VCHEC is currently the only generation facility in Virginia capable of utilizing GOB as a fuel source and has been identified by the DOE as a critical resource in the effort to clean up the millions of tons of remaining GOB. VCHEC's use of GOB results in far less CO_2e emissions than if the GOB were left in the environment. Thus, continuing to operate VCHEC and converting GOB results in a net reduction in greenhouse gas emissions.

Reliability Considerations

As stated earlier, VCHEC uses a mix of waste fuels in addition to a small proportion of mined coal. VCHEC's ability to use diverse fuel sources for generation benefits the Company and its customers as the facility is not reliant on one type of commodity. Additionally, the facility maintains a local inventory of fuel and is therefore not as affected by weather or infrastructure availability. The inventory being local to the station ensures that VCHEC can provide reliable electric generation despite weather or market conditions. VCHEC's reliability value is not limited to its ability to operate every day, but encompasses its ability to dispatch quickly when needed. For instance, during extreme weather events, like Winter Storm Uri in February 2021, VCHEC can ramp up generation to help stabilize the grid and provide reliable generation while other generation resources may be offline or have reduced capacity.

Besides providing reliable power to the region, the plant's synchronous generation supports the electric grid with inertia, frequency support, and short circuit fault current. The inertia and frequency support capability of the plant help stabilize the grid when frequency excursions occur

[29] Chapter 762 of the 2022 Virginia Acts of Assembly.
[30] Chapter 177 of the 2022 Virginia Acts of Assembly.

due to the imbalances of load and generation. The short circuit fault current capability provides the electric current needed to detect faults in the system. These services are key attributes of synchronous generators that help operate and ensure the reliability of the electric grid today.

Early retirement of VCHEC by statute or by the Commission would set in motion a detailed reliability study process at PJM[31] to determine reliability impacts associated with retirement, impacts on surrounding transmission owners, and the necessity of additional projects to ensure ongoing reliability. In this case, Appalachian Power Company, the local transmission operator, would likely be implicated in this process, and may be required to participate in upgrades to ensure continued system reliability. The PJM process that would commence upon notification of VCHEC's retirement is described below.

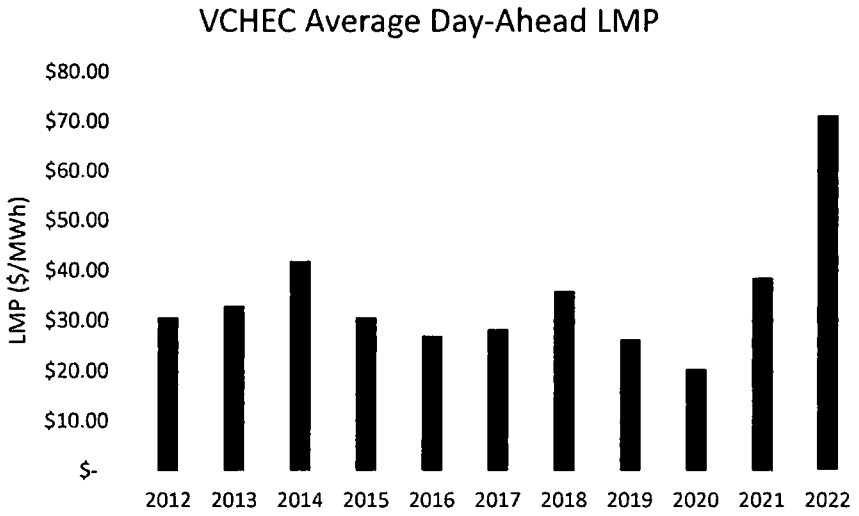
PJM's Federal Energy Regulatory Commission Approved Generation Retirement Process is initiated when a generator notifies PJM that its generation unit plans to retire by a certain date. PJM then notifies any transmission owner to whose system the generator is physically interconnected that the generator is planning to retire. PJM quarterly studies all generators that have indicated they plan to retire to determine if any reliability impacts will result due to the retirement. PJM then coordinates with the impacted transmission operators to determine if they agree with PJM's study results, and to coordinate with them to identify solutions to resolve reliability deficiencies. PJM then reviews and discusses the results of the Generation Retirement Study, including any potential new reliability projects that result from the retirement, with PJM's stakeholders. PJM will then send any proposed reliability projects to the PJM Board of Managers ("PJM Board") for review and approval, and inclusion in the PJM Regional Transmission Expansion Plan. After the PJM Board has approved the reliability projects, they are officially assigned to the impacted transmission operator for project execution.

Economic Viability in the Current Market

Recent market changes have emphasized the need for VCHEC in the Company's generation portfolio. With rising natural gas, oil, and market prices, coal is still an important part of Dominion Energy Virginia's diverse generation fleet. As noted earlier, the facility's onsite inventory of fuel helps to shield the Company's operations from volatile market price fluctuations, particularly during the winter, when gas prices and gas availability are volatile. VCHEC's locational marginal prices ("LMPs"), as seen in Figure 2, significantly increased in 2021 and 2022 leading to high day-ahead energy margins for the station. The day-ahead margins for VCHEC have more than tripled from 2021 to 2022 year-to-date, resulting in significant customer value.

[31] Dominion Energy Virginia is part of the PJM regional transmission organization, which provides service to a large portion of the eastern United States. PJM is currently responsible for ensuring the reliability and coordinating the movement of electricity through all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia. This service area has a population of approximately 65 million.

Figure 2



Note: 2022 data is through September 30

VCHEC also provides dispatchable generation when customer load is highest, which correlates to when weather is hottest or coldest. The Dom Zone had several record peak loads in 2022. On August 9, 2022, the Dom Zone recorded 21,156 MW which was the third highest load ever recorded and the only time the zone has required over 21,000 MW during the summer. As load continues to grow, the Company will need reliable, dispatchable generation to meet the demand of its customers. VCHEC, though not physically located in the Dom Zone, serves Dominion Energy Virginia customer load within PJM and is a reliable and economic asset to meet that need. If the unit retires, the Company would need to replace the energy by purchasing power at the Dom Zone LMP. The Company would also need to purchase capacity around the Base Residual Auction clearing price.

IV. RETIREMENT SCENARIOS

Retirement Analyses

Paragraph 2 (a) of the Stipulation provides that this Report shall include an "[a]nalysis of scenarios in which VCHEC retires prior to 2045, the latest date required by Code § 56-585.5 B 3. Specifically, the Company should include analyses of potential unit retirement in years 2026 and 2030." Additionally, for each retirement scenario included in the Report, the Company must provide "an accompanying lifetime revenue requirement, with supporting calculations, in excel format, with formulas intact" and "a discussion of (i) local economic impacts; (ii) system reliability; (iii) environmental justice; and (iv) the social cost of carbon."[32]

Consistent with the Stipulation requirements, the Company modeled retirement of VCHEC in 2026 and 2030. For the 2026 and 2030 retirement scenarios, the Company used Plan B from its

[32] *2021 Rider S Biennial Update*, Stipulation at Pars. 2(b), 2(c).

2022 IRP Update filing, which was filed on September 1, 2022, in Case No. PUR-2022-00147. Plan B sets the Company on a trajectory toward dramatically reducing greenhouse gas emissions, taking into consideration future challenges and uncertainties. It includes the significant development of solar, wind, and energy storage resources envisioned by the VCEA and preserves natural gas-fired generation to address future system reliability, stability, and energy independence issues, but does not consider emissions of greenhouse gases from existing GOB piles or the environmental benefit of VCHEC remediating this source of greenhouse gases. Plan B uses the Base Case commodity price forecast prepared by ICF for the Company's 2022 IRP Update.

The social cost of carbon is an estimate in dollars of the economic damages that result from emitting one ton of carbon into the air. The Company incorporated the social cost of carbon into its long-term planning process for the first time in the 2021 IRP Update and followed the same approach in the 2022 IRP Update. Specifically, the Company includes the social cost of carbon as an indirect cost of carbon emissions. This indirect cost was included in addition to an assumed federal carbon tax. The Company included a carbon dispatch adder equal to the forecasted price of a direct federal carbon tax in 2026 through 2030. Starting in 2031, the Company then blended the forecasted social cost of carbon with the federal carbon tax through 2046.

Adding the social cost of carbon as an indirect cost, or "shadow price," results in the Company's carbon-emitting generating units operating less often. Because the social cost of carbon is an indirect cost, these costs were not included in the NPV calculations; only costs related to the direct carbon tax were included in the NPV results.

In addition to the modeling scenarios required by the Stipulation, the Company modeled a scenario showing retirement of VCHEC in 2045. Recognizing that limiting the operation of VCHEC is counter to the station's mission to consume GOB, the alternative case (using the high fuel price) does not include the social cost of carbon in the station's dispatch.

The Company performed a high fuel sensitivity to assess the value VCHEC would provide if high fuel prices continue to occur in the future. As fossil fuels become more expensive and supplies are constrained, the value of VCHEC and its locally supplied fuel (the majority of which is not generally marketable) increases. To run this sensitivity, the Company used the High Fuel Price commodity forecast prepared by ICF for the 2022 IRP Update in place of the Base Case commodity forecast. Notably, as seen in Figures 3 and 4 below, even this High Fuel Price sensitivity is below recent market prices, showing forecasted power prices that do not reach current market levels off-peak until almost 2040, and are not projected to reach current market levels on-peak at any point during the forecast period.

Figure 3[33]

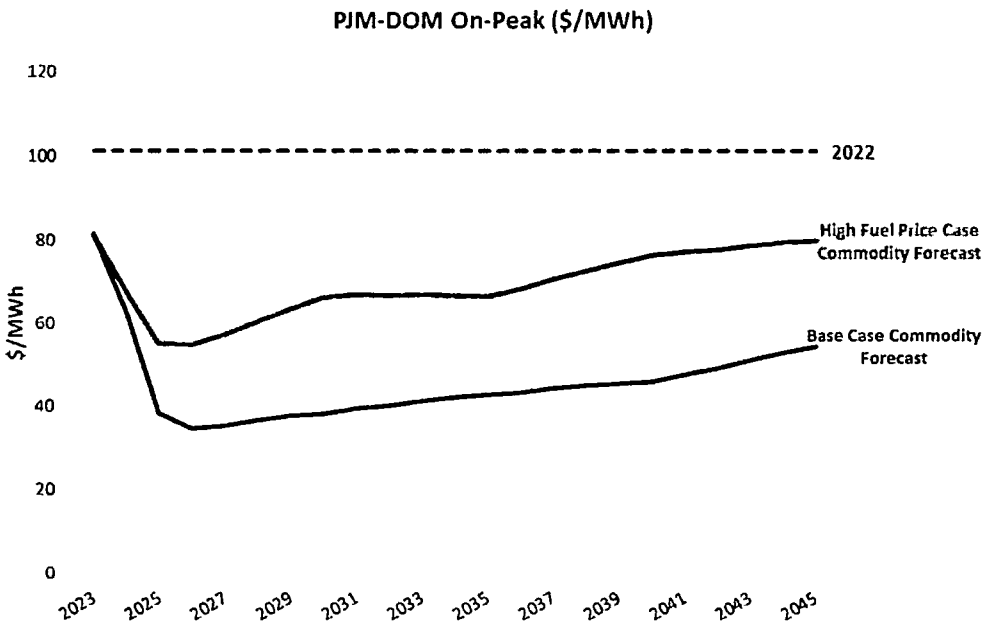
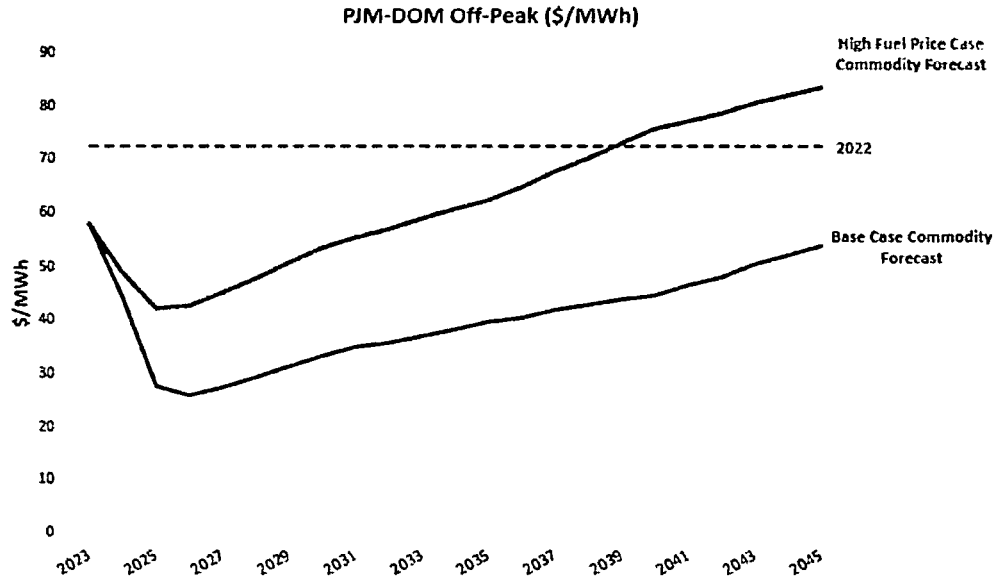


Figure 4



[33] Figures 3 and 4 include nine months of actual price data for January 1, 2022 through September 28, 2022, and forward price forecasts for the remaining months of 2022.

The High Fuel Price commodity forecast utilizes a natural gas supply scenario from the U.S. Energy Information Administration to create a high case of natural gas fuel prices. The movement of natural gas prices impacts the resulting power market commodity prices, including energy, renewable energy certificates, and capacity prices. In the Base Case and the High Fuel Price commodity forecasts, the CO_2 price forecast incorporates the assumption that Virginia exits the Regional Greenhouse Gas Initiative in 2023, and that a federal carbon tax begins in 2026.

Figure 5 provides a comparison of the current market to the Base Case and High Fuel Price Case from the 2022 IRP Update.

Figure 5

	Actuals/Market	Market Price - Calendar 2023	2023-2037 Average Value	
Fuel Price	2022*	Market on 6/28/2022	Base Case Commodity Forecast	High Fuel Price Case Commodity Forecast
Henry Hub Natural Gas ($/MMbtu)	6.74	5.21	3.90	6.62
Zone 5 Delivered Natural Gas ($/MMbtu)	8.41	7.56	3.68	6.40
CAPP CSX: 12,500 1%S FOB ($/MMbtu)	158.17	139.00	73.60	74.24
Electric Prices				
PJM-DOM On-Peak ($/MWh)	101.09	81.40	43.91	65.20
PJM-DOM Off-Peak ($/MWh)	72.47	57.98	36.34	54.38
PJM-DOM RTC ($/MWh)	85.92	68.99	39.90	59.47

* 2022 is 9 months of actuals and 3 months of forward as of 9/28/22.

Notably and as summarized below, VCHEC's operations in this high fuel scenario with a 2045 retirement resulted in a positive NPV of more than $285 million for customers.

Although VCHEC uses a combination of waste coal, waste wood, and mined coal and therefore emits greenhouse gases, its advanced clean coal technology results in lower emissions compared to other coal generation facilities. Additionally, VCHEC's use of waste coal as a fuel source actually results in a net reduction of greenhouse gas emissions compared to leaving the GOB piles to spontaneously combust in the environment. Further, the reclamation of the waste coal to energy, which permanently eliminates the toxic material, is more cost-effective than the alternative of building and maintaining a facility in which GOB is stored indefinitely and continues to emit harmful greenhouse gases.

VCHEC is not like traditional coal-fired generation resources. Because of its ability to use GOB as a fuel source, it provides significant environmental benefits to the Commonwealth. While it remains to be seen what the DOE's report in December will recommend, given the great threat GOB piles pose to the environment, it is possible that a subsidy for the remediation of GOB could be implemented.[34] A credit was proposed in the initial draft of HB 656 in the 2021 session of the General Assembly. Pennsylvania has recognized the significant economic and

[34] *See* discussion of such credits at *ASL Report* at 6, 83, 91-92.

environmental benefits of facilities like VCHEC, and instituted a credit in 2016 to help fund the remediation of GOB piles.[35] If implemented in Virginia, a similar credit would further bolster the economic analysis for VCHEC.

The NPV analyses are attached as Attachment 2, and the top-line results are in Table 2 below.

Table 2

	[redacted]	[redacted]	[redacted]
Average Annual Capacity Factor	**40%**	**31%**	**59%**
NPV ($ millions)	**(40.9)**	**(158.8)**	**285.4**
Waste Coal Consumed[36] (million tons)	**3.7**	**5.9**	**31.3**

The 2026 and 2030 retirement scenarios result in a negative NPV for customers primarily due to low commodity price forecasts, which were modeled by ICF prior to the recent supply changes including the war in Ukraine. By contrast, the 2045 retirement scenario using the High Fuel Price shows a positive NPV of $285.4 million. As noted above, current market prices for fuel are even higher than the High Fuel Price modeled by ICF, which could result in additional customer value if current market trends continue.

Notably, the 2045 retirement scenario does not include the additional environmental benefits for the permanent remediation of GOB. The ASL Report estimates that VCHEC's average annual remediation levels of 400,000 tons per year results in an average of $3.9 million in benefits annually over the next 20 years. As discussed above, the Company continues to seek ways in which to increase VCHEC's use of GOB as a fuel source, which will only further increase benefits to customers.[37]

Revenue Requirements and Bill Impacts

Paragraph 2 (b) of the Stipulation requires that "[f]or any retirement scenario presented in the report, the Company shall provide an accompanying lifetime revenue requirement, with supporting calculations, in excel format, with formulas intact." Consistent with this requirement, the long-term revenue requirements for the 2026, 2030, and 2045 retirement scenarios are included in Attachment 3 to this Report. Supporting documentation in electronic format, as required by the Stipulation, has been posted to the eRoom for Case No. PUR-2021-00114.

[35] Coal Refuse Energy and Reclamation Tax Credit. 72 PA Stat. Ann. § 8701 J.
[36] The amount of waste coal is subject to adjustment depending on the composition of the coal consumed.
[37] *ASL Report* at 3, 13, 29-30.

Revenue requirements for the 2026 and 2030 retirement scenarios naturally show comparatively lower lifetime revenue requirements but they do not include the additional GOB cleanup costs, replacement energy and capacity costs, and any other associated impacts of facility closure. Additionally, those lower lifetime revenue requirements do not result in lower costs for customers in the short term. In fact, early retirement by statute or by the Commission would frontload the facility's lifetime costs into an artificially short near-term period. The Virginia jurisdictional and system lifetime revenue requirements are summarized in Table 3 below for each of the retirement scenarios, with additional detail provided in Attachment 3.

Table 3

2026	$1.8 billion
2030	$2.4 billion
2045	$4.4 billion

The Company also evaluated bill impacts associated with the various retirement scenarios. Table 4 shows the bill impacts for a typical residential customer using 1,000 kWh per month for each of the three retirement scenarios. As Table 4 indicates, both the 2026 and 2030 retirement scenarios show much higher monthly bill impacts in the next four to eight years than the scenario in which VCHEC retires in 2045. Additional detail on the bill impacts is provided in Attachment 4. An executable Excel version of Attachment 4 will also be posted to the eRoom in this docket contemporaneously with the filing of this Report.

Table 4*

2026	$3.75	$5.14	$7.80	$7.29	$6.82	$0.02	$0.02	$0.02	$0.02
2030	$3.72	$4.25	$5.35	$4.64	$4.46	$4.43	$4.22	$4.03	$3.82
2045	$3.70	$3.67	$3.78	$3.27	$3.25	$3.13	$2.99	$2.88	$2.78

* This table shows the average monthly bill impact by year.

Local Economic Impacts, System Reliability, Environmental Justice, and Social Cost of Carbon

Paragraph 2 (c) of the Stipulation requires that "[f]or any retirement scenario presented in the report, the analysis should include, without limitation, a discussion of (i) local economic impacts; (ii) system reliability; (iii) environmental justice; and (iv) the social cost of carbon."

Attachment 1 to this Report contains a study from Mangum Economics that addresses local economic impacts associated with the retirement scenarios detailed above. In short, the Mangum study finds that VCHEC provides significant economic benefits to the region. VCHEC directly

[38] Virginia jurisdiction only.

supports approximately 121 jobs, $15.6 million in labor income, and $110.8 million in economic output annually to southwestern Virginia (in 2022 dollars). Indirectly, VCHEC supports an additional approximately 183 jobs, $9.5 million in labor income, and $45 million in economic output (in 2022 dollars). Combined, the direct and indirect economic benefits, including labor income and economic output, total more than $180 million annually.

Additionally, VCHEC provides significant direct tax revenue to Wise County, Virginia. The county revenue from taxation of VCHEC is projected to be $11.2 million for 2022. If VCHEC continues to operate through 2045, the Mangum Report estimates that it will provide approximately $200.5 million in tax revenue over its remaining life.[39] By comparison, early retirement in 2026 or 2030 would provide one quarter or half of that tax revenue, respectively.

Because the Company is not the regional transmission operator where VCHEC is located, any system reliability analysis would be conducted by PJM and Appalachian Power Company. See Section II of this Report for an overview of the process that would occur if the Company were to retire VCHEC.

Environmental justice considerations favor the continued operation of VCHEC. The region's historic dependence on coal mining activity, relative poverty, and the accompanying disparate public health impacts ensures that many localities in southwestern Virginia qualify as environmental justice communities.[40] Many of these communities are already struggling due to the country's transition away from coal as a fuel source and VCHEC's retirement will only exacerbate the economic hardships these communities are facing. In fact, in April 2021, the Interagency Working Group on Coal and Power Plant Communities and Economic Revitalization ranked southwestern Virginia as fourth out of 25 coal-dependent communities in need of immediate assistance.[41] VCHEC serves these communities in a variety of ways. In addition to the essential economic benefits it provides, VCHEC makes important environmental contributions to the community, as has been described above. Its greenhouse gas emissions are lower than the GOB piles throughout the region it helps to remove, making a net positive environmental impact on the community.[42] VCHEC's use of GOB as a fuel source provides an avenue to cost effectively remove the significantly harmful waste product from the region, restoring land to productive use and positively impacting the environment and health of the local environmental justice communities.

The impact and consideration of the social cost of carbon is addressed in Section II, above.

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[39] These numbers do not incorporate the additional tax revenue generated as a result of the indirect economic activity driven by VCHEC's operations, which would increase the total economic benefits to the region.

[40] *ASL Report* at 5. Va. Code § 2.2-234 defines an environmental justice community as "any low-income community or community of color." Va. Code § 2.2-235 states that "[i]t is the policy of the Commonwealth to promote environmental justice and ensure that it is carried out throughout the Commonwealth, with a focus on environmental justice communities and fenceline communities."

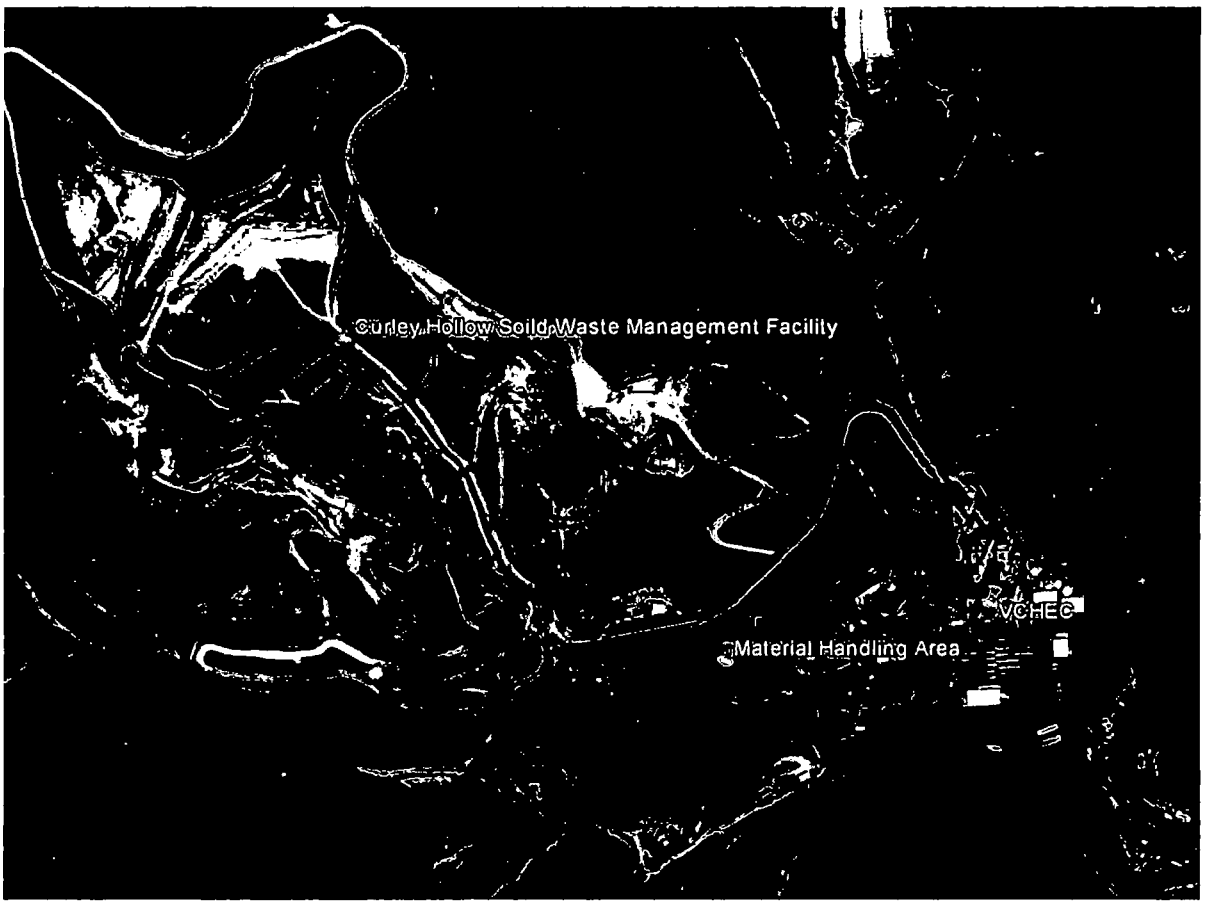
[41] Interagency Working Group on Coal and Power Plant Communities and Economic Revitalization, *Initial Report to the President on Empowering Workers Through Revitalizing Energy Communities* at 10 (Apr. 2021), available at https://netl.doe.gov/IWGInitialReport.

[42] *See supra* Section II.

V. REPURPOSING OPTIONS

Paragraph 2 (d) of the Stipulation provides that this Report shall include an "[a]nalysis of options for repurposing the VCHEC site if the unit is retired, including use for hosting solar, wind, and/or energy storage resources." For each option, the Company must evaluate the local economic impacts, system reliability, environmental justice, and the social cost of carbon. The Company analyzed the potential to use the VCHEC site for solar, wind, energy storage, and nuclear small modular reactors.

The Company first analyzed the existing site to determine the amount of buildable area that could potentially support new facilities. Using land analysis software called PIVVOT, which enables the data visualization and geospatial analysis of specific parcels of land to determine the suitability of energy projects, the Company identified approximately 65 acres of the current VCHEC site suitable for development. The software considers topography, wetlands, and other typical land development constraints. The 65 acres identified includes the area currently occupied by the power block, coal pile, and processing area. Below is an aerial view of the VCHEC site.



Solar

The 65 acres identified could support an approximately 6 MW alternating current ("AC") ground mounted photovoltaic solar generation facility. At this capacity, a potential solar project would ordinarily connect at distribution voltage. Because the VCHEC site is located outside of Dominion Energy Virginia's retail service territory and is not connected to the Company's distribution system, a potential solar facility would not be able to serve as a load reducer for the Dominion Energy Virginia system, as other distribution-level facilities do. An option would be to enter into a wholesale market participation agreement to deliver the energy into the PJM transmission system at a point of interconnection on an existing transmission line at the VCHEC site. However, it is financially and technically challenging to connect a 6 MW project to transmission voltage as would be required for this option. Without the economies of scale associated with a larger distribution-connected project, the cost associated with a 6 MW transmission-connected project is financially impractical. For reference, VCHEC experiences approximately 6 MW in line losses to transport power to the Clinch River substation to distribute to PJM, emphasizing the economies of scale needed to economically interconnect a solar facility.

For these reasons, the Company does not believe solar is a viable alternative use for the VCHEC site. Given the Company's analysis that solar is not a feasible alternative for the VCHEC site, the Company has not included an extended discussion of economic impacts, system reliability, environmental justice, or the social cost of carbon.

Wind

The development of onshore wind within the Commonwealth of Virginia requires siting at specific locations with an available wind resource, such as the limited number of sites along ridgetops located within the state. Given the limited wind resources available at the VCHEC site, including the lack of an available ridgetop, the VCHEC site does not support the economic development of an onshore wind facility. To date, there have been no utility-scale onshore wind generating facilities constructed within the Commonwealth.

For these reasons, the Company does not believe that wind is a viable alternative use for the VCHEC site. Given the Company's analysis that wind is not a feasible alternative for the VCHEC site, the Company has not included an extended discussion of economic impacts, system reliability, environmental justice, or the social cost of carbon.

Energy Storage

The land available at the VCHEC site could potentially support an approximately 600 MW AC lithium-ion energy storage facility. However, the VCHEC site is in an area of the transmission system that is not as ideal as other potential locations in Virginia to deploy such a large energy storage facility. Placing energy storage facilities at other more critical and higher priority locations within the transmission system provides a better value to customers, such as areas that have a high level of variable generation or at locations that are high load centers. This includes installation at alternative locations that may better alleviate grid congestion or take better advantage of energy storage use cases, such as peak shifting. Additionally, energy storage

facilities do not employ the same extensive operations staff as a generation facility, which would limit the primary local economic benefits to local taxation.

Therefore, currently, the Company does not believe energy storage is a viable alternative use for the VCHEC site. Given the Company's analysis that energy storage is not a feasible alternative for the VCHEC site at this time, the Company has not included an extended discussion of economic impacts, system reliability, environmental justice, or the social cost of carbon.

Small Modular Reactors

SMRs are advanced nuclear reactors that have a power capacity of up to 300 MW per unit—about one-third of the generating capacity of a traditional nuclear power station. SMRs are a fraction of the size of conventional nuclear power plants and like conventional nuclear power plants, harness nuclear fission to generate heat to produce energy. The units are designed to be modular, which means the systems and components are assembled in a factory and transported as a unit to a location for installation. SMRs are currently under development in the United States, and the Nuclear Regulatory Commission ("NRC") has engaged in varying degrees of pre-application activities with several SMR reactor designers and license applicants. Earlier this year, the NRC directed its staff to issue a final rule to certify the first SMR design in the U.S., the NuScale SMR design. The final rule for design certification is scheduled for November of this year. Approval and certification of other SMR designs is expected to occur over the next several years.

The VCHEC site could support the siting of various SMR technologies. For this analysis, the Company considered a 300 MW SMR design, but acknowledges that other designs could be supported. The small size and modular construction process makes it possible to site SMRs on a wide variety of lands and near communities that have not been able to be considered in the past, including brownfield sites such as retired fossil-fuel power stations. Based on the site characteristics and available footprint at the VCHEC site, an SMR would fit well within the existing site boundary if VCHEC were to be decommissioned.[43] However, because SMR technology is not yet ready for deployment in the United States, this would not be a near-term alternative solution for the VCHEC site. Based on the status of SMR development, the Company anticipates SMRs could be a viable power generation option by the early 2030s.

Once SMR technology is commercially available, the deployment of an SMR at the VCHEC site would provide a carbon-free source of electricity that is available 24 hours a day, 7 days a week, enhancing system reliability. Although the specific economic impact and number of jobs created would vary depending on the technology selected, it is expected that a new SMR would result in the creation of new jobs and the potential to transition the fossil fuel workforce into the nuclear field. The Commonwealth's 2022 Energy Plan prioritizes the development of this technology within the next decade, and following any retirement decision, VCHEC's site could be considered for such an installation.

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[43] Given the topography of the land surrounding VCHEC, in order to deploy an SMR site on the VCHEC property, the Company would need to utilize the power block and other parts of the site that currently host support structures for VCHEC. Accordingly, VCHEC and SMR infrastructure could not coexist and operate at the same time.

Given the fact that SMR technology is still under development, it would be too speculative to analyze and provide a more extensive discussion of the economic impacts, system reliability, environmental justice, or the social cost of carbon at this time.

VI. CCR UTILIZATION OPTIONS

Paragraph 2 (e) of the Stipulation provides that this Report shall include "[d]iscussion of pathways towards greater utilization of unused coal combustion residuals ("CCR") storage capacity at VCHEC." The Company recently explored the possibility of utilizing storage capacity at VCHEC as part of its 2021 initial Rider CCR filing[44] and in the 2022 annual update.[45]

In the 2021 Rider CCR Proceeding, the Commission directed the Company to conduct a Class 3 study of the Commission Staff's "Rail Option" ("Class 3 Rail Study"), which proposed to utilize VCHEC storage capacity for CCR by constructing a rail spur from the existing rail line near VCHEC to the Curley Hollow Landfill and transporting legacy CCR by rail from the Bremo Power Station and Possum Point Power Station for placement into Cell 2A/3B of the Curley Hollow Landfill.

The Company contracted with AECOM to conduct the studies as directed by the Commission, and the studies were completed in January 2022. The Class 3 Rail Study indicated that there would be significant cost increases associated with transporting legacy CCR material from either Bremo or Possum Point to the Curley Hollow Landfill as compared to the Company's proposal to construct on-site landfills at both sites.

The Class 3 Rail Study indicated that total costs associated with transporting 4 million cubic yards of Possum Point CCR material by rail are projected to be approximately $1.0 billion, while the total costs associated with transporting 6 million cubic yards of Bremo CCR material by rail are close to $1.3 billion. For Possum Point, this represents an increase of approximately $671 million for the CCR project above the costs associated with an on-site landfill solution. For Bremo, the additional cost to the CCR project would be almost $717 million beyond the funding required to complete the removal and transfer to an on-site landfill.

Removal of CCR material from Possum Point and Bremo by rail to the Curley Hollow Landfill at VCHEC would also be a lengthy process. The Class 3 Rail Study indicates that at Possum Point and Bremo, removal of CCR material to Curley Hollow would take approximately 12 years, including associated design work, construction, hauling of CCR material, and final site restoration. These timelines would pose a risk to timely compliance with federal and state CCR requirements for both facilities and are instructive of the time it would take to move CCR from other locations.

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[44] *Petition of Virginia Electric and Power Company For approval of a rate adjustment clause, designated Rider CCR, for the recovery of costs incurred to comply with § 10.1-1402.03 of the Code of Virginia, pursuant to Virginia Code § 56-585.1 A 5 e*, Case No. PUR-2021-00045 ("2021 Rider CCR Proceeding").

[45] *Petition of Virginia Electric and Power Company For revision of rate adjustment clause: Rider CCR, for the recovery of costs incurred to comply with § 10.1-1402.03 of the Code of Virginia, pursuant to Code § 56-585.1 A 5 e*, Case No. PUR-2022-00033 ("2022 Rider CCR Update").

Even if these issues could be overcome, removal of CCR from the Bremo and Possum Point facilities to the Curley Hollow Landfill is opposed by Wise County, Virginia. On December 20, 2021, Wise County Administrator Michael W. Hatfield expressed strong opposition to the notion of hauling coal ash from other parts of the Commonwealth to Curley Hollow and indicated Wise County has ordinances in place prohibiting the disposal of waste at Curley Hollow originating from outside the County. It is Mr. Hatfield's contention that such disposal would be unlawful and/or unpermitted. The Wise County Board of Supervisors letter is attached as Attachment 5 to this Report.

Given the challenges associated with transporting CCR to the Curley Hollow Landfill presented in the AECOM studies ordered by the Commission in Case No. PUR-2021-00045, it is unlikely that there is a way to economically utilize the remaining CCR storage space at VCHEC. Moreover, importing CCR into the area would have potential negative environmental justice impacts on local communities. The letter from Wise County further complicates any effort to move CCR from outside the county to Curley Hollow. In part based on these factors, in Case No. PUR-2022-00033, the Commission rejected recommendations to further study CCR transport options to the Curley Hollow Landfill. At this time, it appears that there are not economically and legally viable pathways to move additional CCR to the Curley Hollow Landfill at VCHEC.

VII. CONCLUSION

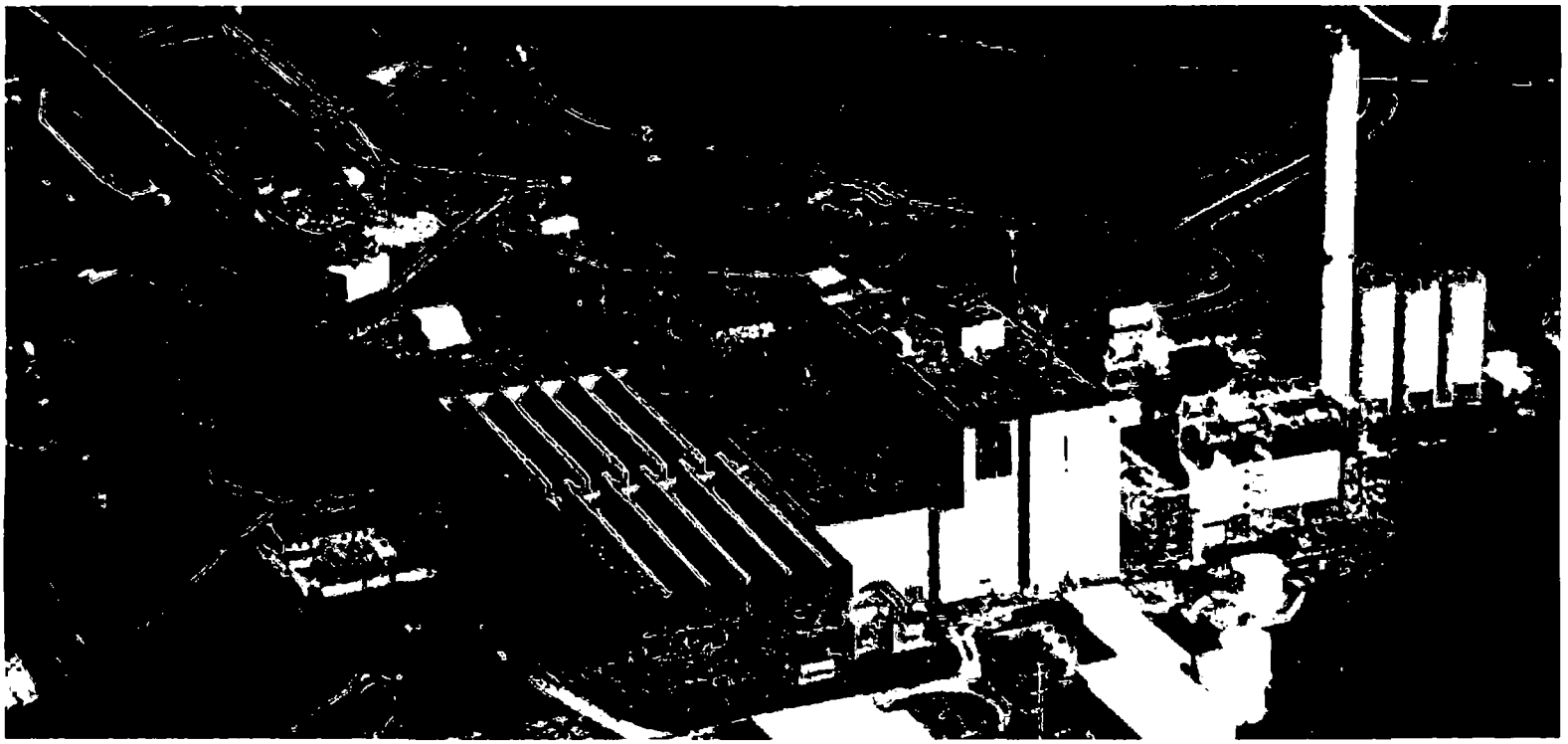
The Company appreciates the opportunity to provide this report to the Commission and interested stakeholders on the Virginia City Hybrid Energy Center. In summary, the Company steadfastly supports continued operation of VCHEC for the many reasons discussed herein. VCHEC generates electricity on the hottest and coldest days of the year when customers need it most, while also providing considerable economic and environmental benefits (both air and water quality) to southwestern Virginia, as well as reliability benefits to the overall electric grid.

Reasonable economic pathways exist for VCHEC to operate well into the future, particularly when considering the unique environmental benefits provided by this facility. Indeed, in a high natural gas price environment, continued operation of VCHEC is economic and in customers' best interest. The Company expects to continue to provide data related to VCHEC's operations and economic position to the Commission in a variety of annual regulatory proceedings, including as part of integrated resource plans, fuel factor proceedings, and updates to Rider S. In the meantime, the Company will continue to monitor each of the specified areas addressed herein and stands ready to provide any additional information if requested.

Attachment 1

VIRGINIA CITY HYBRID ENERGY CENTER

ECONOMIC & FISCAL CONTRIBUTION TO WISE COUNTY AND SOUTHWEST VIRGINIA



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OCTOBER 2022

About Mangum Economics, LLC

Mangum Economics is a Glen Allen, Virginia based firm that was founded in 2003. Since then, we have become known as a leader in industry analysis, economic impact assessment, policy and program evaluation, and economic and workforce strategy development. The Mangum Team specializes in producing objective and actionable quantitative economic research that our clients use for strategic decision making in a variety of industries and environments. We know that our clients are unique, and that one size does not fit all. As a result, we have a well-earned reputation for tailoring our analyses to meet the specific needs of specific clients, with a specific audience.

Most of our research falls into four general categories:

- **Economic Development and Special Projects:** The Mangum Team has performed hundreds of analyses of proposed economic development projects. One recent example was an analysis of the proposed $2.3 billion Green City "net-zero eco district." The Mangum Team has also authored multiple economic development plans, including identifying industry recruitment opportunities created by the high-speed MAREA and BRUSA sub-sea cable landings in Virginia Beach.
- **Energy:** The Mangum Team has produced analyses of the economic and fiscal impact of over 16 GW of proposed solar, wind, battery, and hydro projects spanning more than fifteen states. Among those projects was Dominion Energy's 2.6 GW Coastal Virginia Offshore Wind project off of Virginia Beach. In addition, the Mangum Team has also performed economic and fiscal impact analyses for the natural gas, nuclear, oil, and pipeline industries.
- **Information Technology:** Working with some of the largest names in the industry, to date the Mangum Team has produced analyses of the economic and fiscal impact of the data center industry in multiple states. Among those, were studies conducted in IL, MD, and VA that were instrumental in the passage of industry-specific legislation.
- **Policy Analysis:** The Mangum Team also has extensive experience in identifying and quantifying the intended and unintended economic consequences of proposed legislative and regulatory initiatives.

The Project Team

Martina Arel, M.B.A., *Director – Economic Development & Energy Research*

Rebecca Kyle, *Research Analyst*

A. Fletcher Mangum, Ph.D., *Founder and CEO*

Table of Contents

Executive Summary

This report assesses the economic and fiscal contribution that Dominion Energy's Virginia City Hybrid Energy Center (VCHEC) makes to Wise County and Southwest Virginia. The primary findings from that assessment are as follows:

1) **The VCHEC is a state-of-the-art coal-fired power plant owned and operated by Dominion Energy. VCHEC is located in Wise County, Virginia. The facility is fueled by conventional coal, GOB coal, and biomass and generates enough electricity to reliably serve 150,000 homes.**

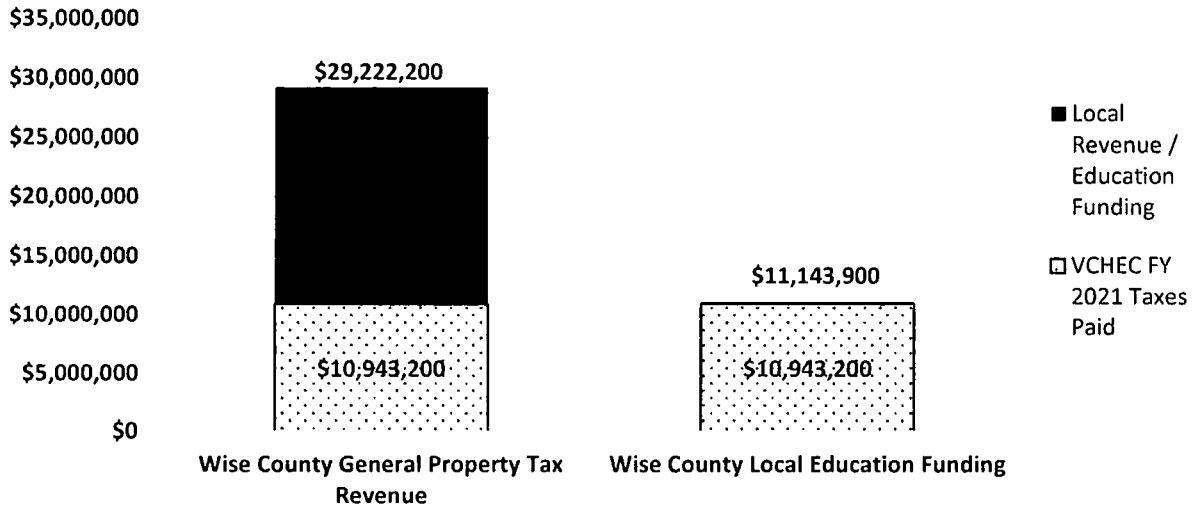
2) **The VCHEC makes a significant economic contribution to Southwest Virginia:**

   - The VCHEC provides an estimated annual economic impact to Southwest Virginia supporting approximately:
     - 304 direct, indirect, and induced jobs.
     - $25.0 million in associated labor income.
     - $156.0 million in economic output.

3) **The VCHEC provides a significant amount of tax revenue to Wise County:**

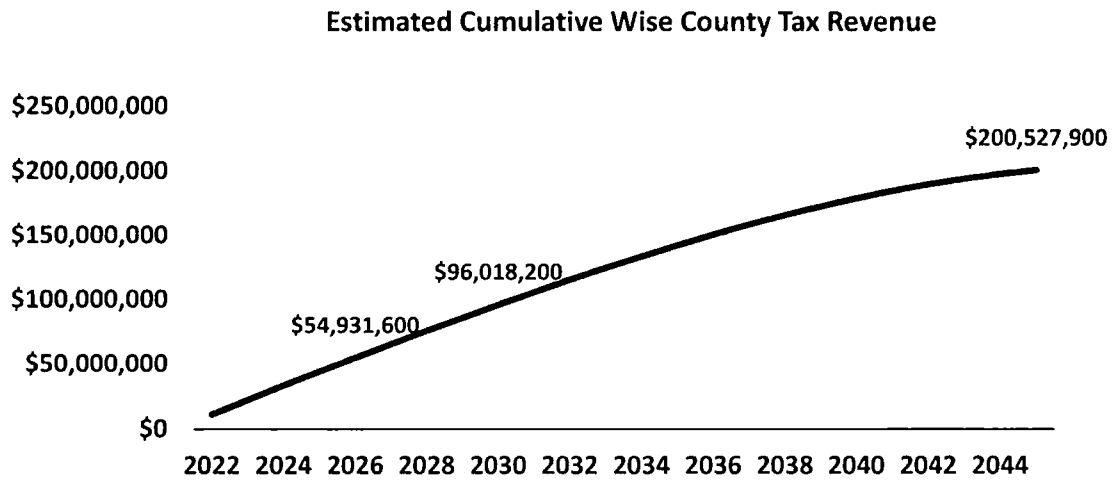
   - In 2021, VCHEC paid approximately $10.9 million in tax revenue to Wise County.[1] This represents approximately 37 percent of Wise County's $29.2 million FY '21 general property tax revenue.[2] The tax revenue generated by VCHEC in 2021 is also almost equivalent to the local $11.1 million portion of the county's school funding in FY '21.[3]

Comparative Impact of FY 2021 VCHEC Tax Revenue on Wise County



[1] Data Source: Dominion Energy.
[2] Data Source: Wise County Annual Comprehensive Financial Report, FY '21.
[3] Data Source: Virginia Department of Education, FY '21 Superintendent's Annual Report for Virginia.

- The VCHEC would generate approximately $11.2 million in personal and real property taxes for Wise County in 2022. If the facility were closed in 2026, VCHEC would provide an estimated $54.9 million in additional revenue to Wise County. If the retirement of the plant was in 2030, the additional tax revenue for Wise County is estimated to be approximately $96.0 million, and if the retirement was in 2045, the additional Wise County tax revenue is estimated to be approximately $200.5 million.



The estimates provided in this report are based on the best information available and all reasonable care has been taken in assessing that information. However, because these estimates attempt to foresee circumstances that have not yet occurred, it is not possible to provide any assurance that they will be representative of actual events. These estimates are intended to provide a general indication of likely future outcomes and should not be construed to represent a precise measure of those outcomes.

Introduction

This report assesses the economic and fiscal contribution that Dominion Energy's Virginia City Hybrid Energy Center (VCHEC) makes to Wise County and to Southwest Virginia. This report was commissioned by Dominion Energy and produced by Mangum Economics.

The Project

The VCHEC is a state-of-the-art coal-fired power plant owned and operated by Dominion Energy. VCHEC is located in Wise County, Virginia. The facility is fueled by conventional coal, GOB coal, and biomass and generates enough electricity to reliably serve 150,000 homes. VCHEC's circulating fluidized bed boilers and air quality control systems allow it to achieve significantly lower emissions than traditional coal-fired power plants. The facility also has a fully lined, captive industrial landfill for storage of coal combustion byproducts and a leachate pond that collects all contact water from the landfill, which is processed in a wastewater treatment facility located onsite. These systems meet or exceed all the current requirements for coal combustion byproduct impoundments.

Construction of the facility began in 2008 and it became operational in 2012. The facility employed over 2,000 people during construction and is currently one of the largest employers in Wise County.

Local Economic Profile

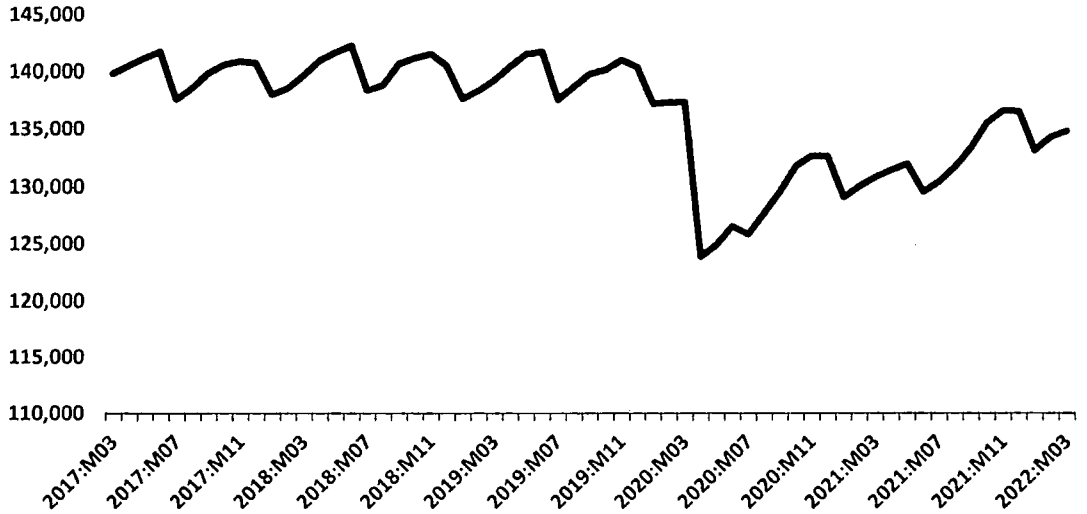
This section provides context for the economic and fiscal impact assessments to follow by profiling the local economy of Southwest Virginia.[4]

Total Employment

Figure 1 depicts the trend in total employment in Southwest Virginia during the five-year period from March 2017 through March 2022. With the exception of seasonal variations, employment in the region was generally stable through 2019. Then, in April 2020 total employment declined significantly due to the lockdowns imposed as a result of the COVID-19 pandemic. Employment has since rebounded but has not recovered to pre-pandemic levels. As of March 2022, total employment in the region stood at 134,900 jobs, which represents an overall decrease in employment of 3.6 percent (or 5,008 jobs) over the five-year period. To put this number in perspective, over this same period, total statewide employment in Virginia increased by 2.5 percent.[5]

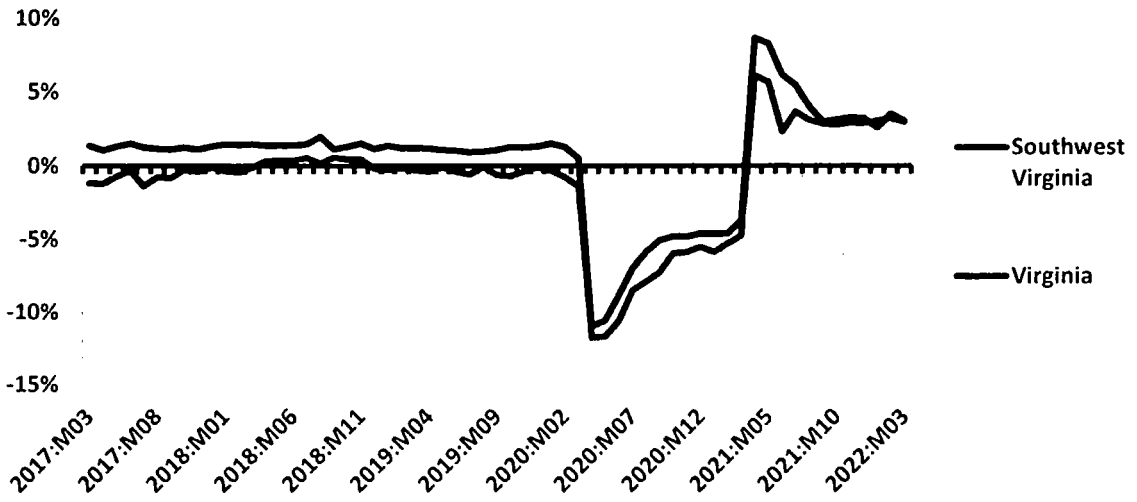
[4] The Southwest Virginia region used in the analysis is comprised of the counties of Bland, Buchanan, Carroll, Dickenson, Grayson, Lee, Pulaski, Russell, Scott, Smyth, Tazewell, Washington, Wise, and Wythe and the cities of Bristol, Galax, and Norton.
[5] Data Source: Bureau of Labor Statistics.

Figure 1: Total Employment in Southwest Virginia – March 2017 to March 2022[6]



To control for seasonality and provide a point of reference, Figure 2 compares the year-over-year change in total employment in Southwest Virginia to that of the state of Virginia over the same five-year period. Any point above the zero line in this graph indicates an increase in employment, while any point below the zero line indicates a decline in employment. As these data show, Southwest Virginia tracked slightly lower than the statewide average for most of the period. As of March 2022, the year-over-year change in total employment in Southwest Virginia was 3.0 percent as compared to 3.1 percent statewide in Virginia.

Figure 2: Year-Over-Year Change in Total Employment – March 2017 to March 2022[7]



[6] Data Source: Bureau of Labor Statistics.
[7] Data Source: Bureau of Labor Statistics.

Employment and Wages by Industry Super Sector

To provide a better understanding of the underlying factors motivating the total employment trends depicted in Figures 1 and 2, Figures 3 through 5 provide data on private employment and wages in Southwest Virginia by industry super sector.[8]

Figure 3 provides an indication of the distribution of private sector employment across industry super sectors in Southwest Virginia in the first quarter of 2022. As these data indicate, the region's largest industry sector that quarter was Trade, Transportation, and Utilities (27,196 jobs), followed by Manufacturing (21,823 jobs), and Education and Health Services (17,894 jobs).

Figure 3: Private Employment by Industry Super Sector in Southwest Virginia – 1st Qu. 2022[9]

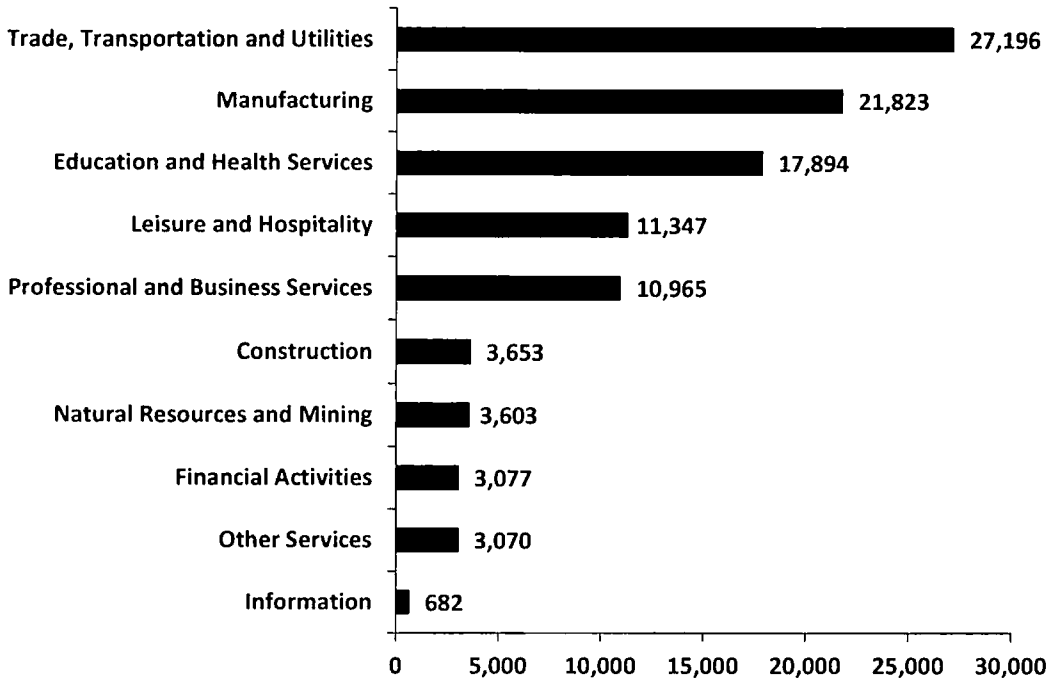


Figure 4 provides a similar ranking for average private sector weekly wages by industry super sector in Southwest Virginia in the first quarter of 2022. As these data show, the highest paying industry sectors that quarter were Natural Resources and Mining ($1,341 per week), Financial Activities ($1,021 per week), and Manufacturing ($982 per week). To provide a point of reference, the average private sector weekly wage across all industry sectors in Southwest Virginia that quarter was $796 per week.

[8] A "super sector" is the highest level of aggregation in the coding system that the Bureau of Labor Statistics uses to classify industries.

[9] Data Source: Bureau of Labor Statistics. Due to data confidentiality data for the Construction, Information, Leisure and Hospitality, Natural Resources and Mining, and Other Services sectors does not include all Southwest Virginia communities.

Figure 4: Average Private Weekly Wages by Industry Super Sector in Southwest Virginia – 1st Qu. 2022[10]

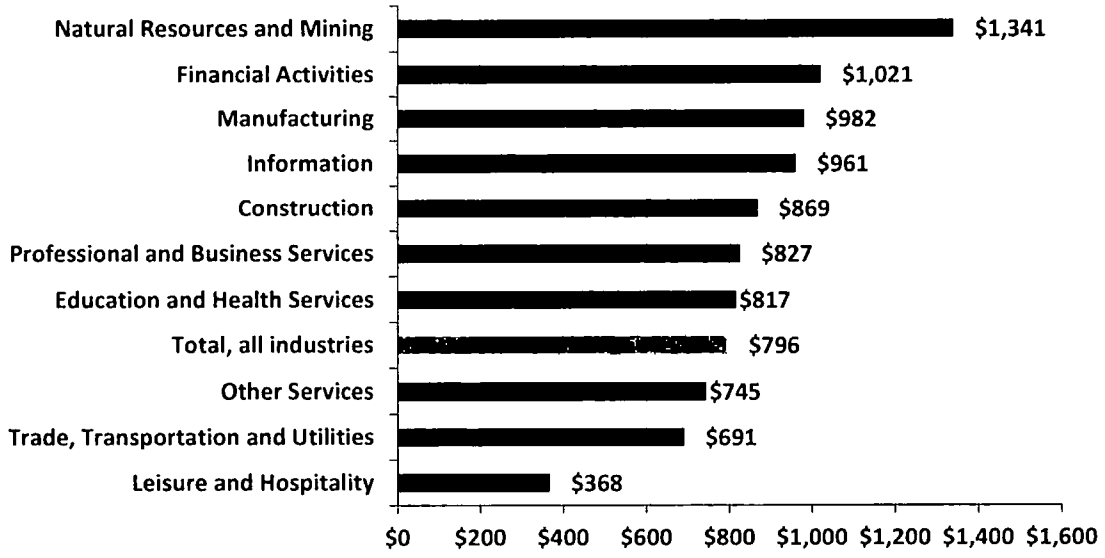
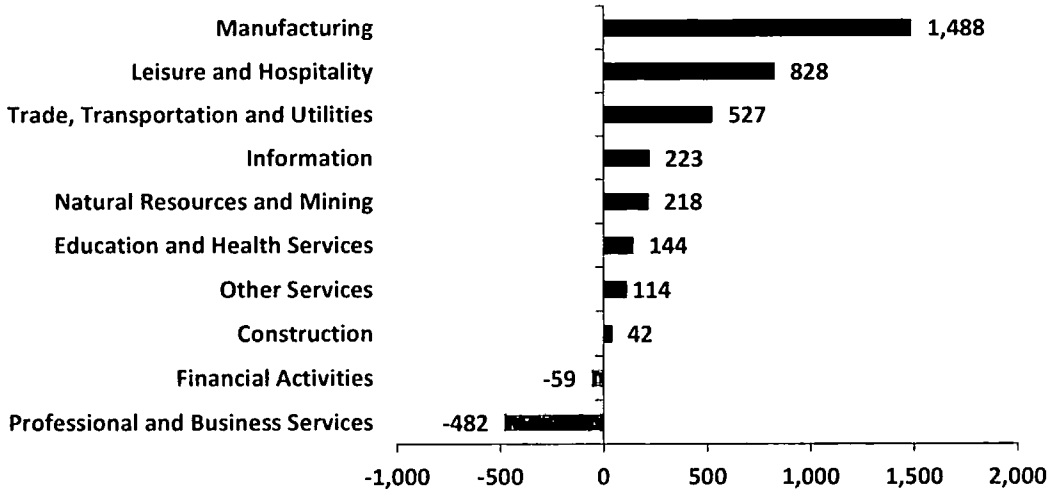


Figure 5 details the year-over-year change in private sector employment from the first quarter of 2021 to the first quarter of 2022 in Southwest Virginia by industry super sector. Over this period, the largest employment gains occurred in the Manufacturing (up 1,488 jobs), Leisure and Hospitality (up 828 jobs), and Trade, Transportation and Utilities (up 527 jobs) sectors. The only employment losses occurred in the Professional and Business Services (down 482 jobs) and Financial Activities (down 59 jobs) sectors.

Figure 5: Change in Private Employment by Industry Super Sector in Southwest Virginia from 1st Qu. 2021 to 1st Qu. 2022[11]

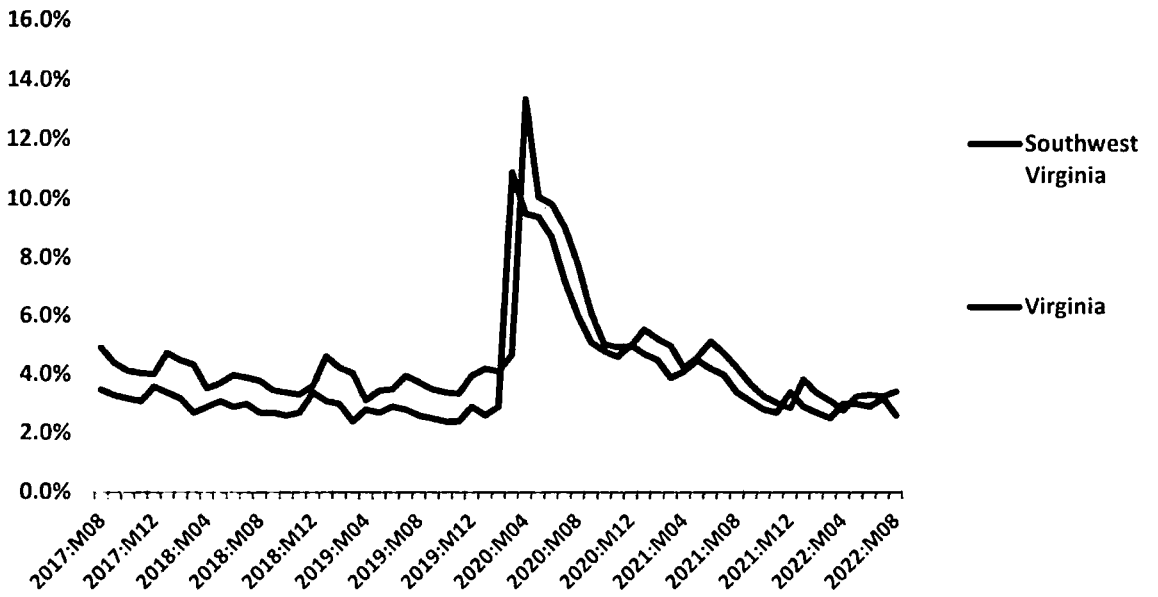


[10] Data Source: Bureau of Labor Statistics. Due to data confidentiality data for the Construction, Information, Leisure and Hospitality, Natural Resources and Mining, and Other Services sectors does not include all Southwest Virginia communities.
[11] Data Source: Bureau of Labor Statistics. Due to data confidentiality data for the Construction, Information, Leisure and Hospitality, Natural Resources and Mining, and Other Services sectors does not include all Southwest Virginia communities.

Unemployment

Figure 6 illustrates the trend in Southwest Virginia's unemployment rate over the five-year period from August 2017 through August 2022 and benchmarks those data against the statewide trend for Virginia. As these data show, unemployment rates in Southwest Virginia tracked higher than the statewide trend throughout the period. In April 2020 unemployment in the region and state significantly rose as a result of the labor dislocations caused by the COVID-19 pandemic. As of August 2022, unemployment stood at 3.4 percent in Southwest Virginia compared to 2.6 percent in Virginia as a whole.

Figure 6: Unemployment Rate – August 2017 to August 2022[12]



[12] Data Source: Bureau of Labor Statistics.

Economic and Fiscal Impact

The analysis provided in this section quantifies the economic and fiscal contribution that VCHEC makes to the Southwest Virginia region on an annual basis.

Method

To empirically evaluate the likely local economic impact attributable to the VCHEC, the analysis employs a regional economic impact model called IMPLAN.[13] The IMPLAN model is one of the most commonly used economic impact simulation models in the U.S. and is commonly employed by universities, state agencies and research institutes. Like all economic impact models, the IMPLAN model uses economic multipliers to quantify economic impact.

Economic multipliers measure the ripple effects that an expenditure generates as it makes its way through the economy. For example, as when the VCHEC purchases goods and services – or when contractors and employees hired by the facility use their salaries and wages to make household purchases – thereby generating income for someone else, which is in turn spent, thereby becoming income for yet someone else, and so on, and so on. Through this process, one dollar in expenditures generates multiple dollars of income. The mathematical relationship between the initial expenditure and the total income generated is the economic multiplier.

One of the primary advantages of the IMPLAN model is that it uses regional and national production and trade flow data to construct region-specific and industry-specific economic multipliers, which are then further adjusted to reflect anticipated actual spending patterns within the specific geographic study area that is being evaluated. As a result, the economic impact estimates produced by IMPLAN are not generic. They reflect as precisely as possible the economic realities of the specific industry, and the specific study area, being evaluated.

In the analysis that follows, these impact estimates are divided into three categories. First round direct impact measures the direct economic contribution of the entity being evaluated (e.g., own employment, wages paid, goods and services purchased by the VCHEC). Second round indirect and induced impact measures the economic ripple effects of this direct impact in terms of business to business, and household (employee) to business, transactions. Total impact is simply the sum of the preceding two. These categories of impact are then further defined in terms of employment (the jobs that are created), labor income (the wages and benefits associated with those jobs), and economic output (the total amount of economic activity that is created in the economy).

[13] IMPLAN is produced by IMPLAN Group, LLC.

Ongoing Operations

This portion of the section assesses the annual economic impact that the VCHEC facility has on Southwest Virginia.

Economic Impact Assumptions

The analysis is based on the following assumptions:

- The VCHEC has annual operating expenditures of approximately $67.0 million and employs approximately 121 individuals.[14]
- The IMPLAN industry spending pattern was adjusted to more accurately reflect VCHEC's purchases of goods and services within Southwest Virginia based on confidential data provided by Dominion Energy.
- The Southwest Virginia study region used in the analysis is comprised of the counties of Bland, Buchanan, Carroll, Dickenson, Grayson, Lee, Pulaski, Russell, Scott, Smyth, Tazewell, Washington, Wise, and Wythe and the cities of Bristol, Galax, and Norton.

Economic Impact on Southwest Virginia

Applying these assumptions in the IMPLAN model using the Southwest Virginia study region results in the following estimates of annual economic impact. As shown in Table 1, annual operation of the VCHEC facility directly supports approximately: 1) 121 jobs, 2) $15.6 million in labor income, and 3) $110.8 million in economic output to Southwest Virginia (in 2022 dollars).

Taking into account the economic ripple effects that direct impact generates, the total estimated annually supported impact on Southwest Virginia is approximately: 1) 304 jobs, 2) $25.0 million in labor income, and 3) $156.0 million in economic output (in 2022 dollars).

Table 1: Estimated Annual Economic Impact on Southwest Virginia from the Ongoing Operation of the Virginia City Hybrid Energy Center (in 2022 Dollars)

Economic Impact	Employment	Labor Income	Output
1st Round Direct Economic Activity	121	$15,587,700	$110,809,500
2nd Round Indirect and Induced Economic Activity	183	$9,462,100	$45,236,800
Total Economic Activity	**304**	**$25,049,800**	**$156,046,300**

[14] Data Source: Dominion Energy.

Fiscal Impact Assumptions

The analysis is based on the following assumptions:

- The facility is assessed by the Virginia State Corporation Commission.
- The facility is located in Wise County.

Fiscal Impact on Wise County

This portion of the section quantifies the direct fiscal contribution that the VCHEC is estimated to make to Wise County. It should be noted at the outset, however, that the analysis that follows likely understates the actual fiscal impact that the facility has on Wise County and Southwest Virginia as it only accounts for the direct fiscal impact that the facility generates. It does not take into account any additional tax revenue that would be generated as a result of the indirect economic activity attributable to the ongoing operation of the VCHEC.

In 2021, VCHEC paid approximately $10.9 million in tax revenue to Wise County.[15] This represents approximately 37 percent of Wise County's $29.2 million FY '21 general property tax revenue.[16] The tax revenue generated by VCHEC in FY '21 is also almost equivalent to the local $11.1 million portion of the county's school funding in FY '21.[17]

As the data in Table 2 indicate, the estimated county revenue from taxation of the real and personal property associated with the facility would be approximately $11.2 million in 2022, with that figure projected to decline to approximately $2.8 million in 2045. If the facility were closed in 2026, it would provide an estimated $54.9 million in additional revenue to Wise County. If the retirement of the plant was in 2030, the additional tax revenue for Wise County is estimated to be approximately $96.0 million, and if the retirement was in 2045, the additional Wise County tax revenue is estimated to be approximately $200.5 million.

[15] Data Source: Dominion Energy.
[16] Data Source: Wise County Annual Comprehensive Financial Report, FY '21.
[17] Data Source: Virginia Department of Education, FY '21 Superintendent's Annual Report for Virginia.

Table 2: Estimated Annual Wise County Property Tax Revenue from the VCHEC until Planned Retirement in 2045

Year	Estimated Annual Local Tax Revenue[18]	Totals (based on Retirement Year)
2022	$11,248,593	
2023	$11,145,393	
2024	$10,990,579	
2025	$10,863,058	
2026	$10,683,971	**$54,931,600**
2027	$10,460,242	
2028	$10,392,626	
2029	$10,212,231	
2030	$10,021,547	**$96,018,200**
2031	$9,752,900	
2032	$9,506,835	
2033	$9,170,022	
2034	$9,122,553	
2035	$8,735,578	
2036	$8,282,209	
2037	$7,832,737	
2038	$7,361,977	
2039	$6,840,056	
2040	$6,328,189	
2041	$5,727,834	
2042	$5,073,881	
2043	$4,362,601	
2044	$3,615,254	
2045	$2,797,043	**$200,527,900**

**Totals may not sum due to rounding.*

The estimates provided in this report are based on the best information available and all reasonable care has been taken in assessing that information. However, because these estimates attempt to foresee circumstances that have not yet occurred, it is not possible to provide any assurance that they will be representative of actual events. These estimates are intended to provide a general indication of likely future outcomes and should not be construed to represent a precise measure of those outcomes.

[18] Data Source: Dominion Energy.

Attachment 2

ICF Base Fuel Case*
Dispatch IS affected by Social Cost of Carbon 2031+

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Dispatch Projections																							
Capacity Factor (%)	50	43	37	27	21	22	24	27	20	13	9	9	9	9	9	9	9	9	9	9	9	9	1
Generation (GWh)	2,757	2,380	2,052	1,506	1,130	1,207	1,335	1,458	1,118	709	510	483	483	484	483	483	483	484	483	483	483	484	14
Fuel (Gbtu)	27,526	23,759	20,480	15,036	11,277	12,044	13,327	14,553	11,161	7,081	5,092	4,817	4,817	4,831	4,817	4,817	4,817	4,831	4,817	4,817	4,817	4,831	137
Coal (Gbtu)	24,773	21,383	18,432	13,532	10,150	10,840	11,994	13,098	10,045	6,373	4,583	4,336	4,336	4,348	4,336	4,336	4,336	4,348	4,336	4,336	4,336	4,348	123
Biomass (Gbtu)	2,753	2,376	2,048	1,504	1,128	1,204	1,333	1,455	1,116	708	509	482	482	483	482	482	482	483	482	482	482	483	14
Coal (Tons '000)	1,690	1,459	1,257	923	692	739	818	893	685	435	313	296	296	297	296	296	296	297	296	296	296	297	8
Waste Coal (Tons '000)	1,183	1,021	880	646	485	518	573	625	480	304	219	207	207	208	207	207	207	208	207	207	207	208	6
GOB (Tons '000)**	760	656	566	415	312	333	368	402	308	196	141	133	133	133	133	133	133	133	133	133	133	133	4
NPV Analysis ($ 000)																							
Capacity Revenue	8,377	9,090	12,696	16,235	19,895	23,669	27,571	31,556	34,354	36,296	38,291	40,346	42,472	43,861	44,695	45,554	46,436	47,338	48,981	51,194	53,474	55,825	24,267
Net Energy Revenue	92,297	58,639	18,757	9,181	7,461	8,174	9,865	11,299	12,666	10,918	9,847	9,625	10,566	10,810	11,222	11,690	12,137	12,495	13,228	13,710	14,780	15,792	2,094
Fixed Cost	(66,640)	(72,032)	(67,706)	(72,447)	(83,196)	(72,234)	(73,410)	(74,810)	(76,238)	(77,907)	(79,173)	(80,683)	(82,221)	(84,020)	(85,385)	(87,012)	(88,670)	(90,609)	(92,080)	(93,834)	(95,621)	(97,710)	(41,079)
Subtotal	34,034	(4,304)	(36,254)	(47,030)	(55,841)	(40,391)	(35,974)	(31,956)	(29,217)	(30,693)	(31,035)	(30,712)	(29,183)	(29,349)	(29,468)	(29,768)	(30,097)	(30,776)	(29,872)	(28,929)	(27,366)	(26,093)	(14,717)
NPV	(334,006)																						
NPV - Retire 2026	(40,864)																						
NPV - Retire 2030	(158,836)																						

** Modeling uses 2022 IRP Plan B build plan and base ICF commodity curves.*
*** GOB is a subset of Waste Coal and is included in the Waste Coal quantity.*

Attachment 2

ICF High Fuel Case*
Dispatch not affected by Social Cost of Carbon

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Dispatch Projections																							
Capacity Factor (%)	50	54	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Generation (GWh)	2,757	2,991	3,290	3,290	3,290	3,299	3,290	3,290	3,290	3,299	3,290	3,290	3,290	3,299	3,290	3,290	3,290	3,299	3,290	3,290	3,290	3,299	1,361
Fuel (Gbtu)	27,526	29,860	32,846	32,846	32,846	32,936	32,846	32,846	32,846	32,936	32,846	32,846	32,846	32,936	32,846	32,846	32,846	32,936	32,846	32,846	32,846	32,936	13,588
Coal (Gbtu)	24,773	26,874	29,561	29,561	29,561	29,642	29,561	29,561	29,561	29,642	29,561	29,561	29,561	29,642	29,561	29,561	29,561	29,642	29,561	29,561	29,561	29,642	12,229
Biomass (Gbtu)	2,753	2,986	3,285	3,285	3,285	3,294	3,285	3,285	3,285	3,294	3,285	3,285	3,285	3,294	3,285	3,285	3,285	3,294	3,285	3,285	3,285	3,294	1,359
Coal (Tons '000)	1,690	1,833	2,016	2,016	2,016	2,022	2,016	2,016	2,016	2,022	2,016	2,016	2,016	2,022	2,016	2,016	2,016	2,022	2,016	2,016	2,016	2,022	834
Waste Coal (Tons '000)	1,183	1,283	1,412	1,412	1,412	1,415	1,412	1,412	1,412	1,415	1,412	1,412	1,412	1,415	1,412	1,412	1,412	1,415	1,412	1,412	1,412	1,415	584
GOB (Tons '000)**	760	825	907	907	907	910	907	907	907	910	907	907	907	910	907	907	907	910	907	907	907	910	375
NPV Analysis ($ 000)																							
Capacity Revenue	8,377	9,090	12,123	14,649	17,258	19,945	22,721	25,587	28,160	30,529	32,971	35,492	38,103	39,094	38,862	38,614	38,348	38,059	38,502	39,498	40,519	41,566	17,765
Net Energy Revenue	92,299	71,331	65,414	46,717	46,090	54,310	62,986	71,855	76,947	78,502	81,369	77,891	80,118	85,049	89,288	93,291	97,341	100,622	100,757	100,332	101,776	110,920	44,010
Fixed Cost	(66,640)	(72,032)	(67,706)	(72,447)	(83,196)	(72,234)	(73,410)	(74,810)	(76,238)	(77,907)	(79,173)	(80,683)	(82,221)	(84,020)	(85,385)	(87,012)	(88,670)	(90,609)	(92,080)	(93,834)	(95,621)	(97,710)	(41,079)
TOTAL	34,036	8,389	9,831	(11,081)	(19,848)	2,020	12,297	22,632	28,870	31,124	35,167	32,700	35,999	40,123	42,765	44,893	47,019	48,073	47,179	45,996	46,675	54,777	20,696
NPV	285,403																						

** Modeling uses 2022 IRP Plan B build plan and ICF High Fuel Case commodity curves.*
*** GOB is a subset of Waste Coal and is included in the Waste Coal quantity.*

Attachment 3

Attachment 3

VCHEC
VA A6 Rider
Summary

2026 Retirement Scenario

Calendar Year	Total Rider Required Revenues VA Jurisdiction Only ($000)	Total Rider Required Revenues Total System ($000)
4/1/22 - 3/31/23	$193,847	$252,280
4/1/23 - 3/31/24	$276,375	$336,326
2024	$418,468	$509,316
2025	$429,943	$523,272
2026	$411,053	$500,233
2027	$1,350	$1,643
2028	$1,349	$1,641
2029	$1,347	$1,639
2030	$1,343	$1,635
2031	$1,339	$1,629
2032	$1,333	$1,622
2033	$1,326	$1,614
2034	$1,318	$1,604
2035	$1,308	$1,592
2036	$1,297	$1,578
2037	$1,284	$1,562
2038	$1,269	$1,544
2039	$1,253	$1,524
2040	$1,234	$1,502
2041	$1,214	$1,478
2042	$1,192	$1,451
2043	$1,168	$1,421
2044	$1,141	$1,389
2045	$1,112	$1,353
2046	$1,081	$1,315
2047	$1,047	$1,274
2048	$1,010	$1,229
2049	$971	$1,182
2050	$929	$1,130
2051	$883	$1,075
2052	$835	$1,016
2053	$783	$953
2054	$727	$885
2055	$668	$813
2056	$606	$737
2057	$539	$656
2058	$0	$0
2059	$0	$0
2060	$0	$0
2061	$0	$0
2062	$0	$0
2063	$0	$0
2064	$0	$0
2065	$0	$0
2066	$0	$0
2067	$0	$0
2068	$0	$0
2069	$0	$0
2070	$0	$0
2071	$0	$0
2072	$0	$0
2073	$0	$0
2074	$0	$0
2075	$0	$0
2076	$0	$0

VCHEC
VA A6 Rider
Summary

2030 Retirement Scenario

Calendar Year	Total Rider Required Revenues VA Jurisdiction Only ($000)	Total Rider Required Revenues Total System ($000)
4/1/22 - 3/31/23	$192,275	$250,367
4/1/23 - 3/31/24	$228,387	$277,932
2024	$287,303	$349,706
2025	$273,255	$332,603
2026	$269,010	$327,427
2027	$274,244	$333,796
2028	$272,025	$331,096
2029	$266,359	$324,201
2030	$257,968	$313,949
2031	$1,464	$1,781
2032	$1,462	$1,779
2033	$1,460	$1,776
2034	$1,456	$1,772
2035	$1,451	$1,766
2036	$1,445	$1,758
2037	$1,437	$1,749
2038	$1,428	$1,738
2039	$1,418	$1,725
2040	$1,405	$1,710
2041	$1,391	$1,693
2042	$1,375	$1,673
2043	$1,357	$1,652
2044	$1,337	$1,628
2045	$1,316	$1,601
2046	$1,291	$1,572
2047	$1,265	$1,539
2048	$1,236	$1,504
2049	$1,205	$1,466
2050	$1,171	$1,425
2051	$1,134	$1,380
2052	$1,095	$1,332
2053	$1,052	$1,280
2054	$1,006	$1,224
2055	$957	$1,164
2056	$904	$1,100
2057	$848	$1,032
2058	$788	$959
2059	$724	$881
2060	$656	$798
2061	$584	$710
2062	$0	$0
2063	$0	$0
2064	$0	$0
2065	$0	$0
2066	$0	$0
2067	$0	$0
2068	$0	$0
2069	$0	$0
2070	$0	$0
2071	$0	$0
2072	$0	$0
2073	$0	$0
2074	$0	$0
2075	$0	$0
2076	$0	$0

Attachment 3

VCHEC
VA A6 Rider
Summary

2045 Retirement Scenario

Calendar Year	Total Rider Required Revenues VA Jurisdiction Only ($000)	Total Rider Required Revenues Total System ($000)
4/1/22 - 3/31/23	$191,203	$249,063
4/1/23 - 3/31/24	$197,073	$239,827
2024	$203,057	$247,189
2025	$193,015	$234,961
2026	$195,985	$238,565
2027	$193,965	$236,107
2028	$192,575	$234,416
2029	$189,950	$231,222
2030	$187,925	$228,758
2031	$187,953	$228,791
2032	$182,230	$221,827
2033	$180,885	$220,191
2034	$178,515	$217,307
2035	$187,613	$228,378
2036	$169,179	$205,946
2037	$171,262	$208,481
2038	$165,854	$201,900
2039	$167,940	$204,438
2040	$167,362	$203,735
2041	$165,894	$201,949
2042	$165,703	$201,716
2043	$168,814	$205,502
2044	$168,363	$204,954
2045	$169,033	$205,727
2046	$1,978	$2,407
2047	$1,976	$2,404
2048	$1,972	$2,400
2049	$1,967	$2,394
2050	$1,960	$2,385
2051	$1,952	$2,375
2052	$1,941	$2,362
2053	$1,928	$2,347
2054	$1,914	$2,329
2055	$1,897	$2,308
2056	$1,878	$2,285
2057	$1,856	$2,259
2058	$1,832	$2,229
2059	$1,805	$2,197
2060	$1,776	$2,161
2061	$1,743	$2,121
2062	$1,707	$2,078
2063	$1,669	$2,030
2064	$1,626	$1,979
2065	$1,580	$1,923
2066	$1,531	$1,863
2067	$1,477	$1,798
2068	$1,420	$1,728
2069	$1,358	$1,652
2070	$1,291	$1,572
2071	$1,220	$1,485
2072	$1,145	$1,393
2073	$1,064	$1,294
2074	$977	$1,189
2075	$885	$1,077
2076	$788	$958

Attachment 4

RESIDENTIAL - 1,000 kWh

	2022	2023	2024	2025	2026	2027	2028	2029
VCHEC RIDER S 2026	$ 3.75	$ 5.14	$ 7.80	$ 7.29	$ 6.82	$ 0.02	$ 0.02	$ 0.02
VCHEC RIDER S 2030	$ 3.72	$ 4.25	$ 5.35	$ 4.64	$ 4.46	$ 4.43	$ 4.22	$ 4.03
VCHEC RIDER S 2045	$ 3.70	$ 3.67	$ 3.78	$ 3.27	$ 3.25	$ 3.13	$ 2.99	$ 2.88

SMALL GENERAL SERVICES - 6,000 kWh

	2022	2023	2024	2025	2026	2027	2028	2029
VCHEC RIDER S 2026	$ 15.40	$ 24.23	$ 37.81	$ 37.84	$ 35.38	$ 0.11	$ 0.11	$ 0.11
VCHEC RIDER S 2030	$ 15.27	$ 20.02	$ 25.96	$ 24.05	$ 23.16	$ 22.96	$ 21.90	$ 20.93
VCHEC RIDER S 2045	$ 15.19	$ 17.27	$ 18.35	$ 16.99	$ 16.87	$ 16.24	$ 15.50	$ 14.92

LARGE GENERAL SERVICES - 10,000 kW

	2022	2023	2024	2025	2026	2027	2028	2029
VCHEC RIDER S 2026	$ 9,485.83	$ 11,920.97	$ 16,573.05	$ 22,394.29	$ 20,952.80	$ 66.95	$ 64.33	$ 62.72
VCHEC RIDER S 2030	$ 9,408.90	$ 9,851.12	$ 11,378.39	$ 14,232.94	$ 13,712.39	$ 13,601.44	$ 12,974.00	$ 12,404.61
VCHEC RIDER S 2045	$ 9,356.45	$ 8,500.43	$ 8,041.91	$ 10,053.51	$ 9,990.04	$ 9,619.92	$ 9,184.72	$ 8,846.19

Attachment 4

RESIDENTIAL - 1,000 kWh

	2030	2031	2032	2033	2034	2035	2036	2037
VCHEC RIDER S 2026	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02
VCHEC RIDER S 2030	$ 3.82	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02
VCHEC RIDER S 2045	$ 2.78	$ 2.72	$ 2.59	$ 2.53	$ 2.46	$ 2.54	$ 2.29	$ 2.32

SMALL GENERAL SERVICES - 6,000 kWh

	2030	2031	2032	2033	2034	2035	2036	2037
VCHEC RIDER S 2026	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.09	$ 0.09	$ 0.09
VCHEC RIDER S 2030	$ 19.81	$ 0.11	$ 0.11	$ 0.11	$ 0.10	$ 0.10	$ 0.10	$ 0.10
VCHEC RIDER S 2045	$ 14.42	$ 14.12	$ 13.45	$ 13.13	$ 12.75	$ 13.16	$ 11.87	$ 12.02

LARGE GENERAL SERVICES - 10,000 kW

	2030	2031	2032	2033	2034	2035	2036	2037
VCHEC RIDER S 2026	$ 61.15	$ 59.67	$ 58.33	$ 57.13	$ 55.84	$ 54.47	$ 54.00	$ 53.46
VCHEC RIDER S 2030	$ 11,743.02	$ 65.22	$ 63.98	$ 62.89	$ 61.71	$ 60.44	$ 60.18	$ 59.86
VCHEC RIDER S 2045	$ 8,554.60	$ 8,375.56	$ 7,973.28	$ 7,791.99	$ 7,564.25	$ 7,812.81	$ 7,045.16	$ 7,131.89

RESIDENTIAL - 1,000 kWh

	2038	2039	2040	2041	2042	2043	2044	2045
VCHEC RIDER S 2026	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02
VCHEC RIDER S 2030	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02
VCHEC RIDER S 2045	$ 2.24	$ 2.27	$ 2.26	$ 2.24	$ 2.24	$ 2.28	$ 2.28	$ 2.29

SMALL GENERAL SERVICES - 6,000 kWh

	2038	2039	2040	2041	2042	2043	2044	2045
VCHEC RIDER S 2026	$ 0.09	$ 0.09	$ 0.08	$ 0.08	$ 0.08	$ 0.08	$ 0.08	$ 0.08
VCHEC RIDER S 2030	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.09
VCHEC RIDER S 2045	$ 11.63	$ 11.78	$ 11.74	$ 11.64	$ 11.63	$ 11.84	$ 11.81	$ 11.86

LARGE GENERAL SERVICES - 10,000 kW

	2038	2039	2040	2041	2042	2043	2044	2045
VCHEC RIDER S 2026	$ 52.85	$ 52.17	$ 51.41	$ 50.57	$ 49.64	$ 48.63	$ 47.52	$ 46.32
VCHEC RIDER S 2030	$ 59.48	$ 59.03	$ 58.52	$ 57.93	$ 57.26	$ 56.52	$ 55.70	$ 54.78
VCHEC RIDER S 2045	$ 6,906.70	$ 6,993.55	$ 6,969.50	$ 6,908.38	$ 6,900.40	$ 7,029.97	$ 7,011.19	$ 7,039.09

Attachment 5

Attachment 5

Wise County Board of Supervisors

Office of County Administrator

TELEPHONE 276-328-2321
FAX 276-328-9780

COURTHOUSE

P.O. BOX 570
206 E. MAIN STREET

WISE, VIRGINIA 24293

December 20, 2021

Dominion Energy
Attn: Ms. Julia D. Pilipenko
External Affairs Representative
2 Technology Drive
Staunton, Virginia 24401

RE: Solid Waste Ordinance

Dear Ms. Pilipenko:

It has come to Wise County's attention that the State Corporation Commission is asking Dominion Energy to study the possibility of hauling coal ash from other parts of the state to the Curley Hollow Solid Waste Management Facility located adjacent to the Virginia City Hybrid Energy Center (VCHEC). While Wise County supports the use of this facility for VCHEC, we oppose the use of this facility by any plants located outside the boundary of Wise County and currently have ordinances in place that do not allow it.

Since 1988 Wise County has had ordinances prohibiting private dumps or landfills in the county. In the years following 1988, Wise County adopted a siting facility ordinance and in 2007 an amendment to modify/clarify the ordinance of 1988 to allow the development of the Curley Hollow site specifically for VCHEC generated waste.

Wise County has and continues to promote and protect Wise County, its' citizens, and environs from unlawful or unpermitted disposal of waste generated outside of Wise County.

Wise County is committed to supporting economic development and existing industry but continues its determination to regulate and approve solid waste management within the boundaries of Wise County.

Thank you for your consideration in this regard. I look forward to continuing the positive working relationship with Dominion Energy. Please contact me if you have any further questions.

Sincerely,

Michael W. Hatfield
County Administrator

MWH/a

CERTIFICATE OF SERVICE

I hereby certify that on this 9th day of November 2022, a true and accurate copy of the foregoing filed in Case No. PUR-2021-00114 was hand delivered, electronically mailed, and/or mailed first class postage pre-paid to the following:

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